

CHAPTER FOUR

Environmental Consequences

4. ENVIRONMENTAL CONSEQUENCES

This chapter evaluates potential environmental impacts that could occur from implementing the management actions described in Chapter 2 of this Proposed Resource Management Plan (PRMP). The baseline used for determining the potential impacts is the current condition of the resources as described in Chapter 3. In general, this chapter is organized by resource topic and contains potential impacts from implementing the proposed management actions. The exception to this organizational structure is impacts from the preferred northern corridor for the North McCullough Road right-of-way (ROW). For ease of comparison, the impact presentation in that section is reversed: The text discusses how the recommended corridor could affect other resources. Discussions of cumulative impacts, irreversible and irretrievable commitment of resources, unavoidable adverse impacts, and the relationship between local short-term uses and long-term productivity conclude the chapter.

4.1 INTRODUCTION

This chapter determines the potential for significant consequences to the natural and human environments should this PRMP be implemented. The analysis includes determinations of three types of impacts, where applicable: direct, indirect, and cumulative. The duration, intensity, and context (local, regional, or national effects) of impacts are interpreted, where possible.

The PRMP was constructed to avoid or reduce resource impacts as much as possible, so—should the management actions be implemented—the potential impacts discussed in this chapter should be considered unavoidable. If the analysis for a specific resource indicated that no impact would occur from implementing the PRMP, or that the impact magnitude on that resource would be negligible, the resource was not included in this chapter. For example, no impacts were identified for actions related to special designations (areas of critical environmental concern [ACEC]), wildland fire management, water resources and quality, geology, minerals, abandoned mines, and hazardous materials. Similarly, if there were no impacts from a specific action or the impact of that action would be negligible, an impacts discussion was not included.

4.1.1 Methodology

Impact analysis is a cause and effect process. The detailed impact analyses and conclusions within this PRMP are based on the planning team's knowledge of resources and the NCA, reviews of existing literature, and information provided by experts in the Bureau of Land Management (BLM), other agencies, and tribes. The plan was configured to maximize benefits and minimize adverse effects on both ecosystem function and the human environment.

This PRMP is based on the best available data for each resource, but because of the National Conservation Area's (NCA) undeveloped nature, specific resource information was often unavailable. In some cases, additional data were required as part of the planning effort to provide sufficient information upon which to base informed judgments. For example, some of the independent studies conducted as part of this planning process included the Native American traditional use of the area, archaeological site composition and distribution, and vegetation community surveys.

Impacts from resources were analyzed and are discussed in detail commensurate with resources issues and concerns identified through scoping. Geographic Information Systems (GIS) analyses and data from field investigations were used to quantify effects where possible, however, in the absence of quantitative data, best professional judgment was used. Acreage figures and other numbers used in this analysis were

approximate projections for comparison and analytic purposes only. As such, they do not reflect exact measures of precise calculations; at times, impacts are described using ranges of potential impacts or in qualitative terms.

4.1.2 Impact Terminology

This chapter uses the terms “impacts” and “effects” interchangeably and the terms “increase” and “decrease” for comparison purposes. Other terms used to describe impacts are defined as follows:

- **Direct effect:** These are effects that are caused by the action and occur at the same time and place.
- **Indirect effect:** These are effects that are caused by the action and occur later in time or are removed in distance, but are still reasonably foreseeable.
- **Cumulative effect:** These are results from individually minor but collectively significant actions taking place over time.

Intensity/Magnitude

- **Negligible:** The impact is at a lower level of detection, and there would be no measurable change.
- **Minor:** The impact is slight but detectable, and there would be a small change.
- **Moderate:** The impact is readily apparent and could result in a small but permanent measurable change.
- **Major:** The impact is large, and there would be a highly noticeable long-term or permanent measurable change.

Context

- **Localized impact:** The impact would occur in a specific site or area. In comparing changes to existing conditions, the impacts would be detectable only in localized areas.
- **Broad impact:** The impact would occur only within the Sloan Canyon NCA but would be larger than the localized impact.
- **Regional impact:** The impact would occur within southern Nevada.
- **National impact:** The impact would occur within the United States.

Duration

- **Short-term effect:** The effect would occur only during or immediately after implementation of the action.
- **Long-term effect:** The effect could occur for an extended period after implementation of the action. The effect could last several years or longer.

To the extent possible, impacts were identified objectively, without characterization as positive or negative, so that the reader might make his or her own judgment. The reason for this approach may be apparent in the recreation discussion that follows. For example, an action may have a predictable outcome of significantly reducing contacts between visitors and the NCA staff. Visitors who value solitude and independence may regard this outcome as a major positive effect; those who value educational experiences with staff experts may regard it as negative. However, for broader scope issues such as providing educational opportunities in general, predictable positive and negative outcomes were described.

4.2 IMPACTS FROM NORTH MCCULLOUGH ROAD RIGHTS-OF-WAY

The Sloan Canyon NCA Act directed BLM to grant the City of Henderson a right-of-way (ROW) for the North McCullough Road and Trail (N-65874) and for the NCA management plan to include a recommendation for the location of the ROW. ROW application N-65874, submitted to the BLM Las Vegas Field Office, contained two potential corridors for the development of the North McCullough Road and Trail, a northern and southern option. The road is intended to be a paved rural road, constructed to provide access to the NCA, trailheads, and overlook points. The road is to be constructed with minimal disturbance to existing grades and vegetation, and the eastbound and westbound lanes would be separated by a natural median. The roadway would be designed for a speed limit of 35 miles per hour (mph) unless a different speed was warranted in certain areas. Related structures could include drainage improvements, bighorn sheep crossings, and parking for trailheads and overlook points. The overall length of the project would be approximately 7 miles.

BLM, in conjunction with the City of Henderson, conducted a review of the potential northern and southern corridors, which consisted of field surveys and resource analyses. A potential road alignment was described for each corridor, and natural, cultural, and design parameters were used to compare the alignments or corridors, depending on the detail of available data. Based on the resource analysis contained in the Draft RMP/EIS, input from the public, and discussions with the cooperating agencies, BLM recommends the northern corridor as the location for the issuance of the ROW. The potential impacts of constructing a road along the northern corridor is described differently in this section than the impacts for all other resources in this chapter. Instead of discussing the impacts to one resource from another (e.g., impacts to wildlife from facilities), this section presents how the potential road and trail would affect other resources (e.g., the impacts of the Northern Corridor on wildlife).

Table 4.1 presents the potential environmental, design, and construction impacts for the Northern Corridor for the major resource categories. This section does not, however, discuss all of the impacts that could occur when construction and operation of the North McCullough Road begins. Because the Sloan Canyon NCA Act requires only that BLM recommend a location for the North McCullough Road and Trail ROW in this plan, further study and environmental reviews would be needed once the road and trail are further along in the planning stages.

Table 4.1. Impacts from the North McCullough Road and Trail - Northern Corridor

Resource Area	Impacts from Northern Corridor
Recreation	Allows access to recreation opportunities—hiking, equestrian use, mountain biking in numerous basins and canyons.
Visual Resources	Provides numerous vistas for scenic overlook opportunities and multiple view sheds along the alignment. Surrounding area can be restored to natural conditions adjacent to roadway and trail.
Vegetation	Contains potential Rosy two-tone beardtongue habitat; 61 acres.
Wildlife	Contains the following potential habitat: <ul style="list-style-type: none"> • Bighorn lambing habitat: 0 acres • Bighorn winter habitat: 251 acres • Desert tortoise: 1,042 acres • Gila monster: 1,283 acres • Chuckwalla: 394 acres • Phainopepla: 41 acres
Hydrology	Potential erosion at drainage crossings. Drainage structures would need to be designed with erosion protection.
PM10	PM 10 generated: <ul style="list-style-type: none"> • Construction: 0.265tons/ac/ month: 11.1 tons/yr • Operational: 42.4 tons/yr (2.1E-3 tons/yr/Vehicle Mile Traveled)
Roadway length	Total length: 6.56 miles.
Disturbance	Total disturbance: 41.9 acres.
Cut/Fill	Total Cut: 30,109 cubic yards Total Fill: 102,621 cubic yards
Grades	Maintain a rolling grade along the alignment with shorter lengths at no more than 12% grade.
Constructability	Would have to cross numerous washes.
Traffic Loading	Per City of Henderson Planning Department, assumed average daily traffic:3021 vehicles.
Vehicle Miles Traveled	Per City of Henderson Planning Department, assumed vehicle miles traveled per day: 19,818 miles.
Cost	Estimated construction cost: \$13,000,000.

Source of engineering/cost data: City of Henderson letter report

4.3 IMPACTS TO RECREATION

The potential impacts of planning decisions on the visitor experience, and their magnitudes, depend on the expectation and values of the individual user. A particular action could benefit some users and have a negative effect on others. Sensitivity to impacts would vary among user types and would be different between new users and traditional users.

Because of the NCA's undeveloped nature, recreation management of the NCA is intended to change over time as monitoring-based management decisions are implemented. Recreation activities within the NCA are expected to increase greatly as public awareness of the NCA grows and as the population of Clark County continues to increase. The primary use areas of the NCA are likely to be the North McCullough Wilderness, the Petroglyph Management Area, designated trails, and areas surrounding developed facilities. The NCA and its visitors would be monitored; if visitation is causing resource

damage, user conflict, or crowding at attraction areas, actions could be taken to enhance the visitor experience and protect resources.

Impacts to recreation from the PRMP could occur in the following resource areas: recreation, North McCullough Wilderness, cultural resources, visual resources, interpretation, facilities, lands and realty, transportation, vegetation management, wildlife management, and livestock grazing.

4.3.1 To Recreation from Recreation

Management Emphasis Areas

Dividing the NCA into management emphasis areas (MEA) as shown in Figure 2.1 would maintain nonmotorized recreation opportunities by emphasizing primitive and nonmotorized uses on 32,411 acres (approximately 67 percent) of the NCA. Opportunities for more visitor facilities and motorized travel would be increased or maintained by designating 15,643 acres (approximately 32 percent) of the NCA for roaded natural opportunities. Opportunities for the most developed types of recreation would be increased by designating 398 acres (less than 1 percent) of the NCA for developed recreation. Conflicts between user types could increase in the more developed management emphasis areas, where use would be higher.

Visitor Experience

Implementing user fees in specific areas of the NCA could have a minor impact on the pattern, timing, and total number of visits to the NCA. Some visitors might not be willing to pay for access, regardless of cost, so recreation use could be displaced from fee areas to non-fee areas. The frequency of visits by local and regional visitors also could decrease, but fees would not be likely to influence levels of visitation from outside the local area. Fees could improve maintenance of recreation facilities by providing additional funding for the NCA.

Installing visitor registers would help establish the visitor use baseline, could help monitor changes to that baseline, and could provide a mechanism for receiving feedback on the NCA's visitor experience.

Hiking/Equestrian Use/Mountain Biking

Requiring that hiking be limited to designated trails, once constructed, in approximately 27 percent of the NCA would decrease opportunities for primitive off-trail hiking, although visitors probably would welcome the opportunity for a trail system in higher-use areas. Before trails were constructed, cross country hiking could occur throughout the NCA. After trail construction, opportunities for primitive, off-trail hiking would be provided in the remaining 35,910 acres (approximately 73 percent) of the NCA. Allowing equestrian use within the NCA, either on designated trails or cross-country, as shown in Figure 2.3, would maintain or increase horseback-riding opportunities. Allowing mountain biking only on a designated and constructed system of multiple-use trails (Figure 2.4) would have minor impacts by reducing potential user conflicts and would increase mountain biking opportunities because current opportunities for mountain biking have been minimal as a result of road and route conditions.

Allowing only horses, burros, or mules to transport people and supplies within the NCA would restrict the use of other types of pack animals (e.g., llamas, goats) for trail and cross-country hiking. This action would limit recreational opportunities for users of these nontraditional pack animals.

Trails

Designing and constructing a trail system to accommodate multiple trail uses, with moderate levels of development providing access to an array of recreational destinations and loop trail opportunities, would increase and diversify trail-based recreation opportunities throughout the NCA. It would also disperse recreation uses to more of the NCA and could be designed to reduce user conflicts and minimize impacts to sensitive natural and cultural resources. Adding trails to the trail system to improve visitor experiences when such additional trails would not cause substantial impacts to cultural and natural resources would result in increased opportunities for trail-based recreation over the long term. Conflicts among trail users would be reduced by the ability to add new trails, and the quality of recreation experiences could be diversified and expanded.

Evaluating unauthorized constructed and social trails and considering whether to close and restore or adopt them into the trail system could cause a minor decrease in recreation opportunities but would maintain or improve resource conditions and limit inappropriate uses.

OHV

The Sloan Canyon NCA Act allows the use of motorized vehicles only on designated roads and trails, so not designating any routes or trails would eliminate this recreational activity from the NCA. Prohibiting off-highway vehicles (OHV) throughout the NCA would eliminate conflicts with nonmotorized visitors and would cause long-term moderate decreases in physical damage to trails and other resources. OHV use probably would be displaced to areas outside the NCA.

Dogs

Allowing dogs in the NCA, if they were on leash, only in designated areas (Figure 2.5) would allow recreational opportunities for dog owners while protecting sensitive resource areas and wildlife in the remainder of the NCA.

Nighttime Use

Allowing primitive and dispersed camping in designated areas of the NCA outside the Petroglyph Management Area would provide opportunities for camping or other overnight uses on approximately 53 percent of the NCA (Figure 2.6). Allowing campfires in the NCA—in fire pans or blankets, that required the importation of all fuel, and required all fire waste products be packed out—would minimize multiple fire rings, trash, and human-caused wildfire and increase visitors' sense of a primitive experience, although it would place a logistical burden on the user.

Restricting the use of the Petroglyph Management Area to Day Use Only, could reduce visitor recreational opportunities, but it would provide maximum protection for sensitive cultural resources and would facilitate wildlife use of Sloan Canyon.

Requiring permits for overnight parking would enhance resource management and the visitor experience by providing a mechanism to support overnight use of the NCA, such as camping.

Other Recreational Use

Allowing bouldering and rock climbing, without permanent anchors, would provide opportunities for visitors who enjoyed the sport. Climbing would be restricted in identified sensitive resource areas, so

potential impacts could be eliminated. Rock climbing could conflict with other recreation activities, such as hunting.

Prohibiting rock hounding in the NCA, would restrict the recreational collection of geologic material but, would provide the maximum protection for the NCA.

Closing the NCA to geocaching and shooting (other than permitted hunting) would have moderate impact on some users by eliminating these types of recreation. Closures could reduce recreation conflicts and help preserve cultural and natural resources but could result in decreased visitor satisfaction.

Prohibiting hunting in the Petroglyph Management Area could impact hunters by restricting access to Sloan Canyon, but it provides important safety element in this high-use area.

Special Recreational Permits

Requiring special recreation permits (SRP) for commercial, competitive, and vending uses, including for organized groups, would have a minor impact on recreation by maintaining consistent uses within the management emphasis areas and avoiding potential use conflicts between users. For example, issuing SRPs to outfitters and guides for wildlife hunts within the NCA would moderately decrease conflicts because hunting could be located in appropriate areas and other recreation users could be informed of the activity. Conducting ongoing evaluations of the number, type, and appropriateness of SRPs and considering issuance limits could have long-term, beneficial impact by decreasing conflict among user groups, decreasing impacts to natural and cultural resources, and maintaining opportunities for all appropriate types of recreation within the NCA. Limiting SRPs could cause a minor loss of economic opportunity for commercial outfitters.

4.3.2 To Recreation from the North McCullough Wilderness

Adopting a flexible and responsive approach to managing recreation uses of the Wilderness would have a major, long-term beneficial effect on the visitor experience because management approaches could be modified on the basis of resource and visitor monitoring within the limits of the Wilderness Management Plan (Appendix C) and the thresholds established through a process similar to limits of acceptable change (LAC). Establishing resource baselines before the predicted large increase in visitation occurred in the Petroglyph Management Area would enable BLM to monitor and predict changes to wilderness characteristics and to modify recreation management actions as necessary.

Visitation

Limiting visitation to numbers that would not cause adverse impacts to wilderness characteristics would maintain or enhance existing primitive and unconfined recreation experiences in the Wilderness, as described in Appendix C, Wilderness Management Plan. However, establishing limits could have a moderate impact on users if they were restricted from accessing specified areas.

Petroglyph Management Area

Once adequate NCA infrastructure is in place, allowing periods of both guided and self-guided use of the Petroglyph Management Area would provide maximum resource and wilderness characteristics protection as well as giving visitor's choice in how to visit the site. During high-use periods, all visitors would be required to join a guided tour, which would have major, long-term impacts on spontaneous and unconfined recreation use but also would decrease crowding and noise. Allowing permits, self-guided

access to the Petroglyph Management Area during low-use periods would maintain limited opportunities for unconfined recreation while decreasing crowding and noise by controlling permit numbers.

Allowing no more than one guided group in the Sloan Canyon Petroglyph Site at a time would reduce crowding and user conflicts. The maximum group size at the Petroglyph Site during guided tour periods would be 20, during self-guided periods would be 25, and 35 people could be at the Petroglyph Site at one time from organized groups. Consequently, during unguided periods, the maximum number of people in the Sloan Canyon Petroglyph Site could be 25 from permits and 35 from an organized group. Issuing a maximum of 25 self-guided permits per hour could mean that some visitors would have to wait before being their walk into the Petroglyph Management Area. Requiring organized groups of between 10 and 35 people to obtain a use authorization and be accompanied by a guide would maintain opportunities for group visitation in Sloan Canyon and decrease crowding and noise; however, it would decrease the opportunity for spontaneous and unconfined recreation use.

Limiting visitor use of the Sloan Canyon Petroglyph Site to the canyon bottom and designated trails (e.g., proposed Petroglyph Trail and Cowboy Trail) within the Petroglyph Management Area would decrease impacts to cultural and natural resources from inappropriate use but would maintain opportunities to view and photograph cultural resources on the canyon walls.

In the Wilderness, designating both the 0.07-mile Petroglyph Trail and the 0.86-mile Cowboy Trail would help protect natural and cultural resources, as well as wilderness characteristics, in Sloan Canyon. Constructing the Cowboy Trail would provide visitors who can not climb over the rockfall a means of accessing the Sloan Canyon Petroglyph Site. Designating and constructing 1.4-mile the Hidden Valley Trail would help protect resources and facilitate avoidance of the wildlife water guzzler.

Controlling access to the Petroglyph Management Area with the visitor center from the north, ongoing patrols, and permitting access from the Hidden Valley Trail would decrease opportunities for primitive and unconfined recreation by increasing the frequency of visitor contact with NCA staff and management controls. During unguided periods, rangers could issue permits to visitors entering the Petroglyph Management Area from other access points and this would further increase interactions with NCA management. Requiring nonguided visitors to experience an interpretive presentation on appropriate visitor use and site etiquette would mean more management interaction but probably would add to the natural and cultural experience.

Designating and constructing trails from Hidden Valley and the visitor center to the Petroglyph Management Area would enhance opportunities to view cultural resources and increase visitor satisfaction. Allowing minimal permanent developments for the purposes of resource protection and enhancement of wilderness values could decrease opportunities for primitive and unconfined recreation but could increase the quality of wilderness recreation by providing improved access, increased information, and enhanced resource protection.

Allowing limited amounts of signage within the Petroglyph Management Area could increase information available to visitors, thereby improving visitor knowledge of the NCA, reducing incidents of visitors getting lost, and minimizing inappropriate recreation use. Placing signage that declares limited access to the Petroglyph Management Area would decrease incidents of visitors inappropriate visitation would but also would decrease naturalness and visitors' sense of primitive, unconfined recreation.

Remainder of the Wilderness

Allowing cross-country travel by foot and horseback would be allowed throughout the Wilderness, outside of the Petroglyph Management Area. This may result in social trails to the more desirable

destinations within the Wilderness. Dispersing visitors using social trails would enhance primitive and unconfined recreation opportunities by controlling the total amount of trails. Blocking and rehabilitating social trails not desired for adoption into the trail system or use could decrease opportunities for primitive and unconfined recreation in the short-term through the addition of temporary developments.

Rehabilitating wilderness disturbances according to a minimum requirement/minimum tool analysis for each project could maintain opportunities for primitive and unconfined recreation but, depending on restoration actions, could decrease the quality of primitive and unconfined recreation during restoration efforts.

Allowing primitive and dispersed camping in the Wilderness, outside the Petroglyph Management Area and the Hidden Valley Trail area (Figure 2.6), maintains opportunities for camping or other overnight uses in the majority of the Wilderness. Requiring campers to be self-reliant, providing no developed camping sites, water, or other amenities, and rehabilitating campsites within one-quarter mile of each other would ensure a primitive and unconfined recreation experience.

Requiring that campfires be made from packed-in fuels, prohibiting the burning of naturally occurring fuels, limiting fires to fire pans or fire blankets, and making campers pack out fire waste products would minimize multiple fire rings, trash, and human-caused wildfire and increase visitors' sense of a primitive experience, although it would place a logistical burden on the user. However, the limited natural fuels, the relatively good weather in the Mojave Desert, and the availability of portable gas, jellied petroleum, or pressurized liquid fuel stoves for cooking makes fires a "luxury."

Allowing bouldering and rock climbing, without permanent anchors, in the Wilderness, outside the Petroglyph Management Area and identified sensitive resource areas, would provide recreational opportunities; however, it could result in conflict with other recreation activities, such as hunting.

Prohibiting dogs within the Wilderness would provide strong resource protection although it could limit recreational opportunities for dog owners.

Signage

Installing low-profile, natural-color signs outside the Wilderness at major access routes that display route information, maps, and visitor information would aid visitors by providing information on ways to enter and experience the area. Primitive and unconfined recreation experiences would be slightly decreased by increased infrastructure at trailheads. Installing visitor registers would help establish the visitor use baseline, could be used to monitor changes to that baseline, and would provide a mechanism for receiving feedback on the NCA's visitor experience.

Disturbance

Rehabilitating vandalized and disturbed areas within the Wilderness, such as two-track roads, to natural conditions, would increase the character of the Wilderness. Nonetheless, the restoration activities themselves could produce minor to moderate short-term impacts to the visitor experience by decreasing solitude because of the presence of the work crews and naturalness from the activity intrusion.

4.3.3 To Recreation from Cultural Resources

Allowing traditional use in the Petroglyph Management Area could cause minor, short-term decreases in available recreation opportunities when these activities took place. Assigning any cultural resource site or site type to the traditional or conservation use categories would produce a minor decrease in recreation

opportunities associated with that site by restricting use of the resource for public viewing and appreciation. Assigning any cultural resource site or site type to the public use category would maintain or increase recreation opportunities to view and appreciate cultural resources.

4.3.4 To Recreation from Visual Resources

Designating visual resource management (VRM) classes as shown in the PRMP (Figure 2.9) would designate approximately 6,600 acres (VRM Class III) where recreation facilities would be located. VRM Classes I and II would place stringent restrictions on the development of recreation facilities on approximately 86 percent of the NCA.

4.3.5 To Recreation from Interpretation

Preparing a Comprehensive Interpretive Plan in conjunction with the tribes, cooperating agencies, and volunteer organizations would have a long-term, major impact on recreation. With enhanced interpretive background and up-to-the-day site information, visitors would be better able to plan their recreational trips to the NCA. Policies to develop interpretive outreach would enhance the recreation experience and provide exposure to the significant resources of the NCA. These interpretive and educational actions would increase the visitor's sense of appreciation and understanding of resources, including the visitor's awareness of important and sensitive cultural values. Indirect benefits would result from a decrease in inadvertent visitor impacts, which would enhance the ability to manage critical physical and social resources.

Implementing an anti-litter program and public awareness campaign would have a moderate impact by providing volunteer opportunities, visitor satisfaction in a litter-free NCA, and a more natural, healthy, and functioning ecosystem.

Allowing the use of low-profile, unobtrusive media in high-use areas would decrease opportunities for primitive and dispersed recreation by adding management presence and infrastructure visible to visitors. Any interpretive media available to visitors could enhance recreation experiences by increasing visitor knowledge and appreciation of NCA resources.

4.3.6 To Recreation from Facilities

Constructing a visitor center near the NCA boundary at the north entrance to Sloan Canyon would have major, long-term impacts by increasing the degree of management presence and infrastructure near the canyon by providing visitor facilities, controlling visitor access, and providing visitor information. Constructing parking lots with interpretive kiosks and vault toilets at Hidden Valley Trailhead, Dutchman Pass Trailhead, and Quo Vadis Trailhead would decrease primitive visitor experiences by increasing management and infrastructure presence but also could enhance recreation opportunities by providing desired facilities and information and accommodating additional visitation and activities such as equestrian use, mountain biking, and hiking.

Providing offsite information in existing facilities throughout the City of Henderson could increase opportunities for residents and visitors to learn about the NCA and its recreation opportunities.

4.3.7 To Recreation from Lands and Realty

Considering applications for new and amended ROWs that would benefit the NCA could increase and enhance recreation opportunities if they supported recreation facilities, eliminated disturbances in recreation areas, or improved naturalness that would be important to dispersed recreation.

Prohibiting commercial filming in the Petroglyph Management Area would eliminate potential conflicts between visitors and film crews. Limiting filming in the remainder of the NCA to developed areas, restricting timing, prohibiting disturbance, and limiting the numbers of cars and people associated with each permit would minimize conflicts between visitors and film crews.

4.3.8 To Recreation from Transportation

Installing physical barriers, signage, or completing vegetation restoration on closed roads and routes would have a moderate long-term impact to visitors by decreasing motorized trespass.

Passage of the Sloan Canyon NCA Act closed all roads and routes in the NCA to public motorized vehicle use. Consequently, designating the Dutchman Pass Road as open to registered vehicles would increase recreation opportunities by allowing access to an area of the NCA historically receiving the highest amounts of use. Designating the Quo Vadis Mine Road and Rattlesnake Canyon Road as open to vehicles also would increase access to the eastern portion of the NCA.

4.3.9 To Recreation from Vegetation Management

Restoring surface disturbances and striving for optimum species diversity would have a moderate, long-term beneficial impact to recreation by increasing the naturalness of the NCA and enhancing the experience of visitors in an environment free from human disturbance.

Focusing restoration efforts in the nonmotorized and roaded natural portions of the NCA would enhance dispersed and developed recreation opportunities by improving naturalness in the majority of the NCA. Eliminating the ability for casual and commercial collection of vegetation, except for scientific purposes, would provide strong protection for the natural resources; however, it would eliminate opportunities for recreational collection of plants and seeds in the NCA.

4.3.10 To Recreation from Wildlife Management

Working cooperatively with agencies such as the Nevada Department of Wildlife (NDOW) to promote healthy and viable wildlife populations in the NCA would provide continued opportunities for wildlife viewing. Avoiding construction of recreation developments, such as trails, within a quarter mile of wildlife water developments could have a minor impact on visitors who wished to go directly to the water developments; overall, however, this action would be likely to lead to continued wildlife population health. There could be a short-term, minor decrease in visitor satisfaction because of disruptions from construction and maintenance if any new wildlife water developments were installed.

Limiting the designation and construction of trails, facilities, and ROWs within known lambing areas could restrict the location and extent of trail-based recreation opportunities. Avoiding trail construction in areas of known bighorn sheep movement between the North and South McCullough Ranges would not affect the location and extent of trail-based recreation opportunities. Seasonal restrictions on trail construction could decrease recreation opportunities or decrease visitor satisfaction by delaying the need for trail construction or repair. Employing small area or seasonal closures to protect wildlife species

during critical life periods could maintain or slightly reduce opportunities for recreation, depending on the nature of the closure.

Eliminating the ability for casual and commercial collection of reptiles, would provide strong protection for these natural resources however it would eliminate opportunities for recreational collection. Educating visitors to be sensitive to raptor nesting could enhance recreation opportunities by providing increased visitor information.

4.3.11 To Recreation from Livestock Grazing

Eliminating the construction of additional range improvements for grazing purposes would maintain existing opportunities for primitive, dispersed recreation.

4.4 IMPACTS TO THE NORTH MCCULLOUGH WILDERNESS

4.4.1 To Wilderness from Recreation

Requiring that hikers remain on designated trails in the Petroglyph Management Area (2 percent of the total Wilderness acreage) would maintain naturalness by limiting social trails and reducing impacts to sensitive cultural resources. Allowing cross-country hiking and equestrian use in the remaining portion of the Wilderness provides for primitive and unconfined recreation, although visitors would naturally gravitate toward the most popular destinations, and these areas may become crowded and solitude lost.

Although most of the Wilderness would be open to cross-country hiking and equestrian use, designating and constructing specific trails for resource protection could minimize impacts to naturalness where users might otherwise develop social trails. These may result in a short-term reduction in wilderness characteristics while the trails were being constructed. Solitude could be decreased with trail construction as increased numbers of people visited the Wilderness using the trail system.

Allowing camping within the Wilderness, outside the Petroglyph Management Area and the Hidden Valley Area, could result in minor to moderate decreases in naturalness over the short and long term from disturbance and litter; however, requiring that campfires be contained to user-provided fire pans or fire blankets and requiring that no natural fuels be used and all fire waste products be packed out would minimize camping impacts. These constraints would place an increased logistical burden on users.

Allowing bouldering and rock climbing in the Wilderness, outside of the Petroglyph Management Area and sensitive resource areas, could cause moderate increases in impacts to naturalness by increasing social trails that would approach climbing areas and increasing associated revegetation and soil compaction near the base of climbing routes.

Prohibiting dogs within the Wilderness would provide strong resource protection although it could limit recreational opportunities for dog owners.

Prohibiting geocaching would increase naturalness by eliminating impacts from new, unwanted trails; litter and trash; revegetation; soil compaction; erosion; and wildlife disturbance from increased visitation near and leading to geocache locations.

Issuing SRPs for guiding and outfitting activities within the Wilderness could increase opportunities for primitive and unconfined recreation but could decrease naturalness and opportunities for solitude by increasing the total amount of visitation. SRPs would require permittee to operate in a manner that

provides wilderness protection, including maintaining existing naturalness, solitude, and opportunities for primitive and unconfined recreation. Allowing vending and competitive-use SRPs in the remainder of the NCA would not affect the Wilderness. Requiring organized groups to obtain SRPs on a case-by-case basis could have minor opportunity impacts by increasing the steps necessary for a group to participate in wilderness recreation, which could displace some users or user groups. Naturalness and solitude for other Wilderness visitors could be improved by directing large-group recreation to an area appropriate for that use.

4.4.2 To Wilderness from the North McCullough Wilderness

The Wilderness Management Plan, Appendix C, could help ensure that management activities considered and protected wilderness characteristics, and it would help manage different use areas, the highly visited Petroglyph Management Area, and the remainder of the Wilderness.

Petroglyph Management Area

During high-use periods, required guided tours into the Petroglyph Management Area would decrease opportunities for primitive and unconfined recreation; however, allowing self-guided tours during low-use periods would minimize the impacts to opportunities for primitive and unconfined recreation. Naturalness would be maintained over the long term because of management controls within the Petroglyph Management Area.

Establishing a group limit of 20 people on guided tours to the Sloan Canyon Petroglyph Site would cause minor decreases in solitude to the people on the tour. Limiting the number of self-guided permits to 25 per hour at the Sloan Canyon Petroglyph Site could cause a minor to moderate decrease in levels of solitude. Although, given the nature of self-guided tours, it is not likely that all 25 people will be in the canyon a one time. Visitors to the Sloan Canyon Petroglyph Site will likely not be experienced wilderness users and may have lower expectations concerning solitude, naturalness, and opportunities for primitive and unconfined recreation.

Requiring organized groups of between 10 and 35 people to obtain a use authorization and be accompanied by a guide to the Sloan Canyon Petroglyph Site would help minimize the impacts to the naturalness of the Wilderness, but would decrease opportunities for primitive and unconfined recreation by increasing visitor contact with management and directed activity. Solitude would be decreased when organized groups visited the site because as many as 60 people (25 from self guided permits) could be in the area. Naturalness would be maintained by ensuring appropriate visitor use in and around sensitive cultural and natural resources.

Controlling access to the Petroglyph Management Area at the proposed visitor center, by issuing permits, and by using ongoing canyon patrols would moderately reduce opportunities for primitive and unconfined recreation by constraining how visitors could experience this portion of the Wilderness and increasing the frequency of visitor contact with NCA staff. Allowing patrols to issue permits to visitors accessing the canyon from other than the visitor center would maintain some opportunities for primitive and unconfined recreation. Requiring nonguided visitors to experience an interpretive presentation on appropriate visitor use and site etiquette would mean more management interaction but probably would add to the natural and cultural experience.

Limiting visitor use of the Petroglyph Management Area to the canyon bottom and designated trails (e.g., proposed Petroglyph Trail and Cowboy Trail) within the Petroglyph Management Area would maintain or increase naturalness in the area over the long term by minimizing social trails, enhance opportunities to view cultural resources, and increase visitor satisfaction. Constructing the Cowboy Trail to avoid the

rockfall area would help maintain naturalness within the canyon by avoiding placement of developments, maintaining primitive and unconfined recreation for those visitors climbing the rockfall.

Prohibiting rock climbing in the Petroglyph Management Area would eliminate future impacts to naturalness, such as social trails and scarred rock faces in the canyon.

Allowing limited signage within Sloan Canyon for resource protection or to control dispersed access would decrease naturalness within the canyon by adding permanent developments. However, naturalness might be enhanced by the signage because resource damage could be prevented. Signage within the canyon could increase information available to visitors, improving visitor knowledge of the area, reducing incidents of lost visitors, and minimizing inappropriate recreation use. Placing access signage in different areas of the canyon limiting access to guided or permitted use would decrease incidents of visitors visiting the canyon without a guide but also would decrease naturalness and visitors' sense of primitive, unconfined recreation.

Remainder of the Wilderness

Dispersing visitor use causing social trails would enhance primitive and unconfined recreation opportunities by controlling the total amount of trails. Blocking and restoring social trails not desired for adoption into the trail system would decrease opportunities for primitive and unconfined recreation. Adopting social trails into the Wilderness system could reduce impacts to natural and cultural resources in the highly desirable destinations.

Allowing minimal permanent developments for the purposes of resource protection and enhancement of wilderness values could decrease opportunities for primitive and unconfined recreation but could increase the quality of wilderness recreation by providing improved access, increased information, and enhanced resource protection.

Allowing primitive and dispersed camping in the Wilderness, outside the Petroglyph Management Area and the Hidden Valley Tail Area (Figure 2.6), would maintain opportunities for camping or other overnight uses in the majority of the Wilderness. Allowing campfires in the NCA—in fire pans or blankets, requiring the importation of all fuel, and requiring all fire waste products to be packed out—would minimize multiple fire rings, trash, and human-caused wildfire and increase visitors' sense of a primitive experience, although it would place a logistical burden on the user.

Allowing bouldering and rock climbing, without permanent anchors, in the Wilderness, outside of Petroglyph Management Area and sensitive resource areas, would provide recreational opportunities; however, it could result in conflict with other recreation activities, such as wildlife watching and hunting, if climbing took place in or around high-demand or sensitive resources.

Prohibiting dogs within the Wilderness would provide strong resource protection and maintain naturalness although it could limit visitation opportunities for dog owners.

Prohibiting geocaching would eliminate potential impacts from this recreational activity and maintain Wilderness characteristics.

Signage and Developments

Installing low-profile, natural-color trailhead signs outside of the Wilderness displaying route information, maps, and visitor information would increase naturalness and opportunities for primitive and

unconfined recreation by improving visitor knowledge of wilderness characteristics and increasing user compliance with rules and regulations.

Allowing minimal developments for resource protection and enhancement of wilderness characteristics could maintain levels of naturalness, solitude, and opportunities for primitive and unconfined recreation by mitigating or preventing damage resulting from wilderness use.

Disturbance

Rehabilitating existing vandalized and disturbed areas within the Wilderness, such as two-track roads, to natural conditions within 4 years of issuance of the Resource Management Plan (RMP) Record of Decision (ROD) would increase the character of the Wilderness. Approximately 3.75 miles of two-track vehicle routes and 0.05 acres of disturbance associated with a rock dam and dug well would be rehabilitated. The rehabilitation activities could produce minor to moderate short-term impacts to the visitor experience by decreasing solitude because of the presence of the work crews and naturalness from the activity intrusion.

Removing or repairing vandalism and illegal dumping in the Wilderness, using appropriate methodology, would increase naturalness and solitude by eliminating trash and vandalism, while causing minor management presence within the Wilderness.

Managing access to the North McCullough Slickrock Catchment #1 in accordance with the Memo of Understanding with the Nevada Department of Wildlife (NDOW) would maintain or enhance wilderness characteristics over the long term by increasing naturalness and solitude by limiting amounts of disturbance associated with vehicle travel and minimizing human presence for maintenance activities.

4.4.3 To Wilderness from Cultural Resources

Managing cultural resources sites for scientific or traditional use (see Section 2.4.4) could cause minor decreases in short-term naturalness, solitude, and primitive and unconfined recreation during activities such as excavation and cultural ceremonies. Managing cultural resources within the Petroglyph Management Area or other sites for conservation use would maintain existing naturalness, solitude, and opportunities for primitive and unconfined recreation at these sites. Managing cultural resources within the Petroglyph Management Area or other sites for public use could decrease naturalness, solitude, and opportunities for primitive and unconfined recreation by increasing the amount of human presence, disturbance at or near these sites.

4.4.4 To Wilderness from Visual Resources

Managing the Wilderness as VRM Class I as described in section 2.4.6, would maintain naturalness over the long term by maintaining the scenic quality of the Wilderness.

4.4.5 To Wilderness from Interpretation

Development of a Comprehensive Interpretive Program for the NCA could affect wilderness characteristics by the installation of temporary or permanent interpretive media. If this media is within the Wilderness, it would decrease naturalness; however, interpretive media located outside the Wilderness but focused on wilderness characteristics could provide long-term benefits by improving visitor knowledge of wilderness and wilderness activities.

Allowing the use of low-profile, visually unobtrusive interpretive media, in areas of high use, for the purposes of resource protection or enhancement of Wilderness values would maintain or have minor impacts naturalness by adding developments within the Wilderness. Opportunities for primitive and unconfined recreation and solitude would be maintained or enhanced by providing information that is critical to wilderness experiences.

4.4.6 To Wilderness from Vegetation Management

Conducting rehabilitation of disturbed areas within four years of the RMP ROD could increase long-term naturalness by restoring natural vegetation conditions but also could decrease it in the short term by allowing the use of mechanized or motorized tools if determined appropriate.

Allowing rehabilitation of disturbed areas through natural processes could increase naturalness over the long term and would maintain solitude and naturalness in the short term by minimizing the amount of management activity within the Wilderness. However, minor decreases in naturalness could result from the spread of invasive species such as red brome.

Prohibiting collection of vegetation within the Wilderness would maintain existing levels of naturalness.

4.4.7 To Wilderness from Wildlife Management

Allowing construction and maintenance of wildlife waters within the Wilderness according to the memorandum of understanding (MOU) with the Nevada Department of Wildlife (NDOW) (BLM 2003c), could cause minor to moderate decreases in naturalness, solitude, and primitive and unconfined recreation during maintenance and construction operations. This impact would occur over the long term because of the presence of permanent developments.

Allowing temporary animal damage control activities would cause moderate short-term decreases in naturalness, solitude, and opportunities for primitive and unconfined recreation by increasing the numbers of people within the Wilderness and possibly increasing temporary developments within the Wilderness. Repairing resource damage caused by wildlife could result in minor long-term increases in naturalness by reestablishing native species or reducing non-native species.

4.4.8 To Wilderness from Livestock Grazing

Prohibiting supplements (e.g., salt licks) and range improvements in the Wilderness would maintain existing levels of naturalness, solitude, and existing opportunities for primitive and unconfined recreation.

4.5 IMPACTS TO CULTURAL RESOURCES

Impacts to cultural resource sites from authorized uses would be mitigated through identification and evaluation of the resources under the Nevada Protocol and through project avoidance, redesign, and, if necessary, data recovery. As use of the NCA increases, authorized and unauthorized uses of cultural resources are expected to increase. Human activity poses the greatest threat to cultural resources in the Sloan Canyon Petroglyph Site, through vandalism or inadvertent damage. Increased management of human activity in areas with a high concentration of cultural resources is designed to reduce the potential for impacts to cultural resources.

4.5.1 To Cultural Resources from Management Emphasis Areas

Approximately 67 percent of the NCA would be managed for primitive and nonmotorized recreation, and an estimated 82 prehistoric sites would be present in the affected area.

4.5.2 To Cultural Resources from Recreation

Restricting hiking to designated trails, once they are designated and constructed, could direct use away from culturally sensitive areas on approximately 27 percent of the NCA. Cross-country hiking impacts would be eliminated in the Petroglyph Management Area, and access to this area would be on two proposed trails from the north and the Hidden Valley trail from the south. Allowing cross-country hiking through the remainder of the NCA would increase incidental damage to cultural resources. Hikers could be drawn to interesting but culturally sensitive features in this area, increasing resource damage. Adding to the trail system would require standard inventories and clearances and cultural resources would be a factor in final trail design.

Focusing equestrian use on designated trails could direct such use away from culturally sensitive areas. Allowing cross-country equestrian use through 60 percent of the NCA could increase incidental damage to cultural resources. Restricting mountain bike use to designated routes on 6,969 acres (approximately 15 percent) of the NCA would eliminate impacts from bike use for sites located away from designated routes. Sites adjacent to designated routes could be impacted by erosion from water diverted by the route, as well as from route widening and braiding. Sites on the remaining portion of the NCA would not be impacted by mountain bike use.

Evaluation and consideration of incorporating unauthorized constructed and social trails into the trail system, and blocking and restoring that were environmentally unacceptable, would decrease incidental damage, vandalism, or theft on cultural sites impacted by the existence of social trails. It also would decrease the number of new social trails, which could decrease the impact on other sites. However, dispersing social trail use to other areas could increase minor impacts to cultural resource sites by dispersing use from an impacted area to nonimpacted areas.

Requiring organized groups obtain SRPs on a case-by-case basis would allow for user education before visits, which could result in a minor reduction of incidental damage outside the Petroglyph Management Area. This impact also would apply to vending and competitive-use SRPs.

4.5.3 To Cultural Resources from the North McCullough Wilderness

Petroglyph Management Area

Requiring guided use of the Petroglyph Management Area during periods of high use would decrease incidental damage and vandalism to cultural resources. During periods of low use, self-guided tours would maintain or slightly decrease moderate impacts from incidental damage and vandalism. Requiring nonguided canyon visitors to acquire permits and to experience interpretive presentations on appropriate use and etiquette would decrease minor impacts from incidental damage and vandalism.

Restricting access in the Petroglyph Management Area to no more than one guided group at a time would decrease impacts to the cultural resources in this area. Requiring guided use of the canyon for groups of 10 to 35 people, regardless of time, would decrease potential impacts associated with larger groups.

Managerial presence—specifically in the form of ongoing canyon patrols, access control, and signage at trailheads—would decrease incidental damage, vandalism, and theft in periods of high and low use. Limiting canyon use to the hours the visitor’s center would be open would further decrease impacts to cultural resource sites because of increased monitoring and surveillance.

Limiting recreation use of the Petroglyph Management Area to the canyon bottom and a few designated trails would have long-term benefit to cultural resources located on the canyon sides by reducing erosion from social trails and inadvertent damage. Constructing a few trails also would decrease the need for and impacts from social trails. The severity of impact of direct trail effects such as data recovery efforts, accidental damage, and disturbance would depend on implementation of trail placement. Designing, constructing, and maintaining trails (at the north and south entrances of the Petroglyph Management Area) would allow for preservation of cultural resource sites by focusing intensive recreation use in areas where such use would not affect cultural resource sites.

Dispersing social trail use to other areas could increase minor impacts to cultural resource sites by dispersing use from an impacted area to nonimpacted areas. Dispersal could increase incidental damage and vandalism to cultural resource sites. Blocking and restoring social trails would decrease incidental damage, vandalism, or theft on cultural sites impacted by the existence of the social trails. It also would decrease the number of new social trails, which could decrease the impact on other sites.

Allowing minimal developments for resource protection could help protect cultural resources and decrease damage impacts. Installing signs would increase the effectiveness of restoration actions, increasing the preservation of affected sites. Removing and repairing evidence of vandalism in the Petroglyph Management Area and the Wilderness would remove social cues that could encourage other visitors to behave similarly.

4.5.4 To Cultural Resources from Cultural Resources

Establishing and implementing a monitoring program could be used to establish a cultural resources baseline and provide information for management decisions if unacceptable changes were to occur. The monitoring program would allow for early detection and treatment of sites affected by inadvertent damage, vandalism, or natural deterioration, increasing preservation of cultural resource sites.

Assigning half of the cultural resource sites to conservation for future use and traditional use would protect these sites and the information they contained while allowing for traditional uses. Although long-term research opportunities may be limited on half of the sites, managing the remainder of the sites for scientific uses, among others, could increase scientific knowledge of these sites. However, more sites would be preserved through data recovery rather than preserved in place.

Managing half of the sites, excluding rock art sites, for scientific, public, and traditional uses would allow for scientific study of these resources, increasing scientific knowledge of these sites while allowing for traditional uses. Preparing some of these sites for public use would increase scientific knowledge. Half of the rock art sites would be conserved for scientific study to the exception of other uses.

Managing sites not eligible for the National Register of Historic Places, including simple isolated sites, for experimental and scientific use would result in basic data recovery or use of these simple sites. This management would provide minor research opportunities.

Petroglyph Management Area

Managing cultural resource sites in the Petroglyph Management Area for traditional, conservation, public, and scientific uses would ensure their preservation from disturbance, while allowing for traditional and scientific uses. Preparing the sites for public use would increase scientific knowledge of the area. Allowing scientific use with a restriction to scientific activities that would have no effect on a site's eligibility for the National Register of Historic Places would limit the range of recovery methods. Such use and restrictions would preserve these sites in place, although it could limit the amount and level of information that would be recoverable.

4.5.5 To Cultural Resources from Interpretation

Preparing and implementing an interpretative plan would have moderate, long-term benefits by increasing public appreciation of cultural resources values of the NCA and surrounding area. Developing the interpretive program in cooperation from tribes, interested agencies, and volunteer organizations would enhance interpretation opportunities and communication. Increased public appreciation could lead to better visitor stewardship behavior. Benefits associated with stewardship behavior would include increased protection of cultural sites, decreased inadvertent damage to or disturbance of cultural sites, decreased vandalism and looting, and preservation of the integrity of cultural resources.

Placing interpretive media, such as educational signs or printed materials, for easier visitor use would increase education and interpretation of NCA users concerning the presence of cultural resources and their vulnerability to damage and destruction through human or natural processes. Guided tours also would include a stewardship message, and interpretive information would be given to all permittees, including outfitters and guides. This approach would decrease minor incidental damage to cultural resource sites as mindfulness and stewardship would be imparted to visitors.

Developing interpretive materials in cooperation with interested tribes would provide opportunities to convey Native American perspectives regarding the NCA.

4.5.6 To Cultural Resources from Facilities

Constructing a visitor center near the NCA boundary at the north entrance to Sloan Canyon and a parking lot and associated features at the Hidden Valley Trailhead would require standard inventories (Section 106) that could identify additional cultural resource sites. More extensive staff and interpretive facilities would increase visitor contacts with BLM staff, thereby reducing incidental damage, vandalism, or theft.

The presence of the visitor center, with a central theme of the NCA's association with Native Americans, would provide unique educational opportunities for visitors. In addition, designing the center to accommodate Native American activities or uses would convey the importance of NCA resources to Native Americans.

Constructing parking areas and providing interpretive material at the Hidden Valley, Dutchman Pass, and Quo Vadis Trailheads could inform visitors about sensitive resources and reduce impacts to the resource. This strategy could allow visitors to receive interpretive and educational information, reducing user-related impacts to cultural resources. The parking areas would require standard inventories (Section 106) that could identify additional cultural resource sites.

4.5.7 To Cultural Resources from Transportation

Cultural resource sites adjacent to the Hidden Valley Road, Dutchman Pass Road, Quo Vadis Mine Road, and Rattlesnake Canyon Road could be impacted by erosion from water diverted by the route, as well as from route widening and maintenance activities. Increased use on these roads could result in minor damage or vandalism to cultural resource sites.

4.5.8 To Cultural Resources from Vegetation Management

Avoiding surface-disturbing activities within sensitive or Special Status Species habitat would preserve cultural resources in these areas in place. Restoring and improving the natural conditions of native plant communities would minimize erosion and incidental damage to cultural resources in disturbed areas.

4.5.9 To Cultural Resources from Wildlife Management

Permanently closing trails or areas, including restricting activities, to protect wildlife species also would preserve cultural resource sites in these areas. Limiting trail construction and facility and ROW placement in known bighorn sheep lambing areas, areas of known bighorn sheep movement, and known raptor nesting areas could preserve cultural resource sites in these areas from incidental damage, disturbance, or destruction related to such developments and use. Seasonally restricting trail construction and facility and ROW placement for wildlife management would not necessarily afford the same preservation because construction and use could occur.

4.5.10 To Cultural Resources from Wildland Fire Management

Surface disturbances related to suppression activities (e.g., fire line construction, hand-line construction) could have minor to moderate impact on cultural resources. These impacts would be unlikely, however, because of the limited opportunity for natural wildland fire in the NCA.

4.5.11 To Cultural Resources from Livestock Grazing

Implementing BLM's Mojave-Southern Great Basin Resource Advisory Council (RAC), Standards and Guidelines for Rangeland Health and Guidelines for Grazing Administration (BLM 1997) would contribute to improved range conditions and soil and vegetation stability, reducing new and continued impacts to cultural resources from erosion. Developing new range improvements could have minor, long-term impacts on cultural resource sites.

4.6 IMPACTS TO VISUAL RESOURCES

Impacts to visual resources are described in terms of impact to scenic quality—meaning alteration of the natural components of the landscape such as landform, vegetation, color, adjacent scenery, and relative scarcity of a given type of landscape. Impacts also are described in terms of viewer sensitivity, which is a qualitative assessment of public concern for scenic quality.

Most proposed developments, facilities, or other disturbances would be mitigated to meet the objectives of the VRM class where the activity would take place, and a complete contrast rating analysis would be completed before design of all proposed projects. Facilities or other uses existing at the time of designation that would cause impacts to visual resources within the NCA would be considered pre-

existing, nonconforming uses. Visual resource objectives would be considered for the City of Henderson road and trails ROWs called for in the Sloan Canyon NCA Act.

4.6.1 To Visual Resources from Recreation

Restricting hiking use to designated trails, once designated and constructed and could cause minor decreases in scenic quality where trails were constructed within the 13,129 acres of the NCA where hiking would be limited to trails. However, limiting hiking to constructed trails could decrease or eliminate development of social trails, which would maintain scenic quality. Viewer sensitivity to constructed trails would likely be less than sensitivity to social trails.

About 41,852 acres of this area would fall within VRM Classes I and II. Allowing equestrian use on designated trails and areas open to cross-country equestrian use could decrease scenic quality from constructing trails on 6,309 acres of the NCA, about 2,000 acres of which would fall within VRM Classes I and II. However, limiting equestrian use to constructed trails could decrease or eliminate development of social trails, which would maintain scenic quality.

Allowing mountain biking only on designated trails could cause short- and long-term decreases in scenic quality on 6,969 acres of the NCA, about 2,000 acres of which would fall within VRM Class II. However, limiting equestrian use to constructed trails could decrease or eliminate development of social trails, which would maintain scenic quality.

Constructing additional trails on an as-needed basis could adversely impact the visual quality of the area; however, where existing social trails have had even more of a negative impact they could be used, in addition to restoration efforts to help remedy the greater impact.

Closing the NCA to all OHV use would maintain or increase scenic quality in the NCA by reducing use and disturbance of currently used OHV areas and routes. Viewer sensitivity to OHV-related disturbances would be reduced over time as routes and areas were manually or naturally rehabilitated.

4.6.2 To Visual Resources from the North McCullough Wilderness

Restoring existing vandalized and disturbed areas within the Wilderness, such as two-track vehicle routes, to natural conditions within 4 years of issuance of the RMP ROD would be a beneficial impact to the Wilderness. Approximately 3.75 miles of two-track vehicle routes and 0.05 acres of disturbance associated with a rock dam and dug well would be rehabilitated. Nonetheless, the restoration activities themselves could produce minor to moderate short-term impacts to the visual resources because of the presence of the work crews and naturalness from the activity intrusion.

Petroglyph Management Area

Locating limited amounts of signage within Sloan Canyon or placing access signage within the canyon could cause minor decreases in scenic quality within Sloan Canyon. Viewer sensitivity to signage would be moderately increased by the confined canyon setting.

Constructing a trail routed to avoid the rockfall area would maintain scenic quality in and around Sloan Canyon by avoiding the need for permanent developments, such as a ladder, at the rockfall and routing the majority of canyon visitors through an adjacent wash that would not require substantial constructed features.

Restoring soils and vegetation could increase the potential for minor short-term decreases in the scenic quality of the wilderness landscape and minor increases in viewer sensitivity during restoration projects. However, restoration would increase the scenic quality of the Wilderness landscape over the long term. Closure of social trails, using natural materials, and restoration of visible portions using natural materials would increase the scenic quality of the NCA and decrease viewer sensitivity to social trail disturbances.

4.6.3 To Visual Resources from Cultural Resources

Assigning the Sloan Canyon Petroglyph Site or other prehistoric and historic sites to the public use category could cause minor decreases in scenic quality within and surrounding the sites by accommodating the increased visitation (e.g., trails).

4.6.4 To Visual Resources from Visual Resources

Designing features of signage, structures, or facilities to meet VRM objectives could maintain or increase the scenic quality of the existing landscape and maintain or decrease visitor sensitivity to changes.

Designating the North McCullough Wilderness as VRM Class I would preserve the existing character of the landscape on 14,765 acres (approximately 30 percent) of the NCA. Designating 27,089 acres of the NCA (approximately 56 percent) as VRM Class II would maintain or increase scenic quality by limiting certain types of development within this portion of the NCA. Designating a 6,596-acre portion of the NCA (approximately 14 percent) as VRM Class III would partially retain the existing character of the landscape in these areas and could accommodate existing disturbances, including facilities described in the proposed plan. No VRM Class IV would be designated, eliminating the potential for major changes to scenic quality or viewer sensitivity in the NCA.

4.6.5 To Visual Resources from Interpretation

Installing low-profile interpretive signage in areas of high use could decrease scenic quality and increase viewer sensitivity to the signs. Installing highly visible media in staging areas could cause minor to moderate decreases in scenic quality and increases in viewer sensitivity. Installing low-profile, visually unobtrusive interpretive media in the Wilderness could cause minor to moderate decreases in scenic quality and moderate increases in viewer sensitivity to signage.

4.6.6 To Visual Resources from Facilities

The design of visitor facilities would comply with visual resource class objectives for the area where the facility would be located. For example, the visitor center would cause moderate to major long-term increases in viewer sensitivity by adding a large facility in a previously undisturbed area. Construction of a visitor center would cause moderate to major short-term decreases in scenic quality near the NCA boundary at the north entrance to Sloan Canyon.

Construction of parking lots, kiosks, and vault toilets at the Hidden Valley Trailhead and Quo Vadis Trailhead and similar facilities plus an equestrian staging area at the Dutchman Pass Trailhead would cause moderate long-term decreases in scenic quality in these areas by adding facilities in primarily natural areas. The facilities would cause only minor increases in viewer sensitivity at the Dutchman Pass Trailhead, because of adjacent development, but would cause moderate increases in viewer sensitivity at the Hidden Valley Trailhead and Quo Vadis Trailhead because of the undeveloped nature of these areas.

4.6.7 To Visual Resources from Lands and Realty

Renewing ROWs for communication facilities would maintain current scenic quality and viewer sensitivity over the long term. Renewing ROW grants with expiration dates would maintain existing scenic quality and viewer sensitivity to facilities. Allowing amendments to existing ROWs that would meet the intent of the Sloan Canyon NCA Act could increase the scenic quality of the NCA and decrease viewer sensitivity resulting from the addition of facilities.

Any new or amended ROWs would have to benefit the NCA, so construction of visible new ROW facilities or construction of facilities in new ROWs would be required to maintain or decrease existing levels of visual contrast. This would lead to maintained or increased levels of scenic quality and decreased viewer sensitivity to ROW facilities. Prohibiting new communication sites would maintain existing scenic quality and viewer sensitivity to ROWs.

4.6.8 To Visual Resources from Vegetation Management

Conducting rehabilitation in disturbed portions of primitive and nonmotorized MEAs would increase scenic quality over the long-term; however, it could cause moderate short-term decreases in scenic quality and increases in viewer sensitivity in project areas.

4.6.9 To Visual Resources from Wildlife Management

Allowing construction and maintenance of wildlife water developments in the NCA or the Wilderness could have minor, long-term impacts to scenic quality and viewer sensitivity by creating increased visual contrasts where water developments were constructed.

4.6.10 To Visual Resources from Wildland Fire Management

Fire suppression efforts could cause minor decreases in scenic quality if these efforts involved surface disturbance.

4.6.11 To Visual Resources from Livestock Grazing

Continuing to allow grazing in the NCA and the Wilderness could cause minor decreases in scenic quality if grazing caused alterations in the vegetation composition.

4.7 IMPACTS TO INTERPRETATION

The Sloan Canyon NCA Act identifies one of the NCA's purposes as enhancing the area's educational resources for the enjoyment of present and future generations. Interpretation of the NCA increases visitors' emotional and cognitive connections to resources and visitors' respect and appreciation for the NCA's resources and improves visitor experiences. Interpretation can occur both on and off site through a wide variety of media. Although there currently is no onsite interpretation in the NCA, opportunities exist; this section analyzes the impacts of RMP decisions on these opportunities.

4.7.1 To Interpretation from Recreation

Requiring users (hikers, equestrians, bikers) to stay on designated trails in some areas would retain the trailheads and trails as onsite interpretive opportunities. Onsite interpretive opportunities would increase for equestrians and mountain bikers.

Designing and constructing a trail system to accommodate multiple trail uses would increase interpretive opportunities for multiple user groups who used similar trailheads and trails. This trail system also could provide interpretive and educational opportunities for user groups with different habits and goals. Including moderate levels of development in and near trails and associated facilities could provide opportunities for interpretive media that would be conducive to resources such as loop trails or focal points for an array of recreational destinations. Adding trails would increase interpretive opportunities.

4.7.2 To Interpretation from the North McCullough Wilderness

Installing trailhead access signage outside the Wilderness would increase interpretive visitor interface, providing opportunities for interpretation of wilderness values. Although these opportunities would not side the Wilderness, a trailhead provides the opportunity to set the stage for an interpretive experience.

Petroglyph Management Area

Allowing visitor use of the Petroglyph Management Area through both guided and self-guided tours, depending on visitation rates, would allow users to choose the type of interpretive opportunity they desired (formal interpretive programs or self-guided tours). Requiring interpretive presentations for nonguided visitors from the north entrance to the Petroglyph Management Area would provide formal interpretive opportunities for self-guided users before entering the canyon. At other areas, nonguided visitors would experience an informal briefing while obtaining a use permit. In addition, using a BLM-guide interpretive interface during periods of high use would decrease message interference compared with not using guides during busy periods. Allowing organized groups to use the Petroglyph Management Area only when accompanied by a guide would provide for formal interpretive opportunities. A group size to 10 to 35 people could slightly decrease the effectiveness of interpretive communication.

Limiting the number of self-guided tour permits would decrease the number of individuals in the Petroglyph Management Area, which would decrease interpretive interference and increase the effectiveness of interpretation for Petroglyph Management Area users. Locating limited signage in the canyon could cause a minor increase in communication of the interpretive message. Limiting visitor use to the canyon bottom and a small set of designated trails would expand interpretive opportunities as all visitors would remain in a relatively close group. The designated trails could allow closer a relationship between visitors and resources that could enhance communication of the interpretive message.

Requiring ongoing patrols of the Petroglyph Management Area by rangers or other staff during visitor use hours would provide opportunities for informal interpretation. Informal interpretation, or interpretation that was not planned, would have one-on-one benefits similar to those of formal interpretation and could be tailored to varying resources and conditions.

4.7.3 To Interpretation from Cultural Resources

Allowing public use of cultural sites in the Petroglyph Management Area would provide interpretive opportunities. Maintaining the site in its natural condition would not impede the ability to deliver the

interpretive message. Assigning cultural use sites for public use could provide for increased interpretive opportunities. Not assigning rock art outside the Sloan Canyon Petroglyph Site to public use could result in a minor decrease in interpretive opportunities because the only area available for interpretation would be in the Petroglyph Management Area.

4.7.4 To Interpretation from Interpretation

Developing and implementing a Comprehensive Interpretive Program, which includes the preparation of the Interpretive Strategy and Environmental Education Strategy (Appendix E), would result in a major impact to interpretation by providing an integrated, thorough interpretive program. This program would decrease the potential for contradictions in communication materials or approaches. Encouraging partnerships with other organizations could improve both through development and delivery of interpretive messages.

Allowing use of low-profile, visually unobtrusive interpretive media would increase opportunities for interpretation, allowing for communication of interpretive messages. Limiting stationary interpretive media to specific areas identified for interpretation would focus intensive interpretive opportunities in areas best suited to deliver the interpretive message. Providing a full range of interpretive media would result in a moderate increase in the ability to deliver interpretive messages.

4.7.5 To Interpretation from Facilities

Constructing a visitor center near the NCA boundary at the north entrance to Sloan Canyon would result in a major increase in interpretive opportunities. Including an interpretive use area, outdoor amphitheater, and classrooms would provide a spectrum of areas where interpretive interference could be eliminated and successful interpretive communication could be maximized through formal and informal interpretation, including through other media. Construction and maintenance of a visitor center could cause moderate decreases in opportunities for offsite interpretation by shifting the emphasis to the visitor center.

Impacts at the Hidden Valley Trailhead and Dutchman Pass Trailhead would include interpretive opportunities in staging areas and trailheads would increase. Constructing a parking lot with an interpretive kiosk at the Quo Vadis Trailhead would increase interpretive opportunities in that area. Parking lots could be used as staging areas and trailheads.

Providing information throughout the City of Henderson could result in a minor increase in offsite interpretive opportunities about the NCA's resources.

4.7.6 To Interpretation from Transportation

Allowing registered vehicles to use existing roads (Dutchman Pass Road, Quo Vadis Mine Road, and Rattlesnake Canyon Road) would result in a major impact to interpretation. Each road would provide opportunities for various types of interpretation. Closure of other roads would produce a minor impact, depending on the resources being interpreted.

4.8 IMPACTS TO FACILITIES

Currently there are no existing facilities at the Sloan Canyon NCA. This section analyzes impacts to future facility development from the different management decisions.

4.8.1 To Facilities from Recreation

Designing an extensive trail system could cause moderate to major increases in the need for, use of, and maintenance of associated visitor facilities and parking areas as visitor use increased over the long term. Limiting hiking use to designated trails (13,129 acres) could cause moderate to major increases in the need for, use of, and maintenance of the visitor center, Hidden Valley Trailhead, Dutchman Pass Trailhead, and Quo Vadis Trailhead facilities as visitor use increased over the long term.

Designating horse trails and areas open to cross-country equestrian use (34,855 acres) could cause moderate to major increases in the need for, use of, and maintenance of the Hidden Valley Trailhead, Dutchman Pass Trailhead, and Quo Vadis Trailhead facilities over the long term. Additional design elements, such as horse trailer parking and horse tie-up areas, could be needed at these locations.

Restricting mountain biking to designated areas (6,969 acres) could cause moderate to major increases in the need for, use of, and maintenance of the Dutchman Pass Trailhead, Quo Vadis Trailhead, and Hidden Valley Trailhead over the long term. Additional design elements, such as bike racks, could be needed at those locations.

4.8.2 To Facilities from the North McCullough Wilderness

Requiring the use of designating hiking trails in approximately 2 percent of the Wilderness for resource protection could cause moderate to major increases in design, use, and maintenance of facilities. Designating the wash in the canyon bottom from the visitor center at the north entrance of Petroglyph Management Area would increase the need for, use of, and maintenance of the visitor center. Additional design elements—such as comfort stations, parking, interpretive exhibits, and service offerings—for directed visitation could be required. Constructing a trail from the Hidden Valley Trailhead to the Petroglyph Management Area would increase the need for, use of, and maintenance of the Hidden Valley Trailhead. Additional design elements and services, such as comfort stations and adequate parking areas, could be required. Installing trailhead access signage and visitor information would cause moderate increases in the design, use, and maintenance of facilities near access points for entering the Wilderness. In areas lacking facilities, moderate to major increases in the amount of visitor-created parking areas could occur over the long term as visitor use increases.

Petroglyph Management Area

Designating the Petroglyph Trail and the Cowboy Trail as the north access to the Sloan Canyon would cause major increases in the need for, use of, and maintenance of the visitor center. Because a large percentage of visitation to the NCA is expected to occur in the Petroglyph Management Area, directed visitation to the north entrance and use of that entrance as the access control point would place higher demands on facility maintenance and repairs. Additional design elements—such as comfort stations, parking, interpretive exhibits, and service offerings—for directed visitation would be needed.

Construction of a trail from the Hidden Valley Trailhead to the Petroglyph Management Area could cause major increases in the need for, use of, and maintenance of the Hidden Valley Trailhead over the long term. Directed visitation would place higher demands on facility maintenance and repairs. Additional design elements—such as comfort stations, parking, and interpretive material—for directed visitation could be needed. Requiring all nonguided canyon visitors at the north entrance to Sloan Canyon to view an interpretative presentation could create a need for appropriate design elements at the visitor center.

4.8.3 To Facilities from Cultural Resources

Cultural resources surveys that would comply with Section 106 of the NHPA would be completed as part of the facility design. Depending on the results, the survey could have minor impacts on the design and construction of facilities.

4.8.4 To Facilities from Facilities

Developing a large visitor center as the main entrance to the Petroglyph Management Area with substantial interpretive, educational, and administrative elements would have a major impact on design requirements such as building sizes and uses. Infrastructure needs such as water and power could require advanced coordination with the City of Henderson, although the utility needs of the NCA would have minor impacts to the overall urban system.

Providing visitor facilities and reclaiming existing visitor-created parking areas would direct visitation to desired areas and could reduce the amount of dispersed parking. Resources such as cultural sites, plant habitat, soils, and hydrology patterns located within or near the location for the Hidden Valley Trailhead and Dutchman Pass Trailhead could restrict flexibility with regard to facility size and placement. The Dutchman Pass Trailhead, within Clark County's air quality nonattainment area, might need to be constructed to reduce fugitive dust.

Resources such as cultural sites, plant habitat, tortoise habitat, soils, and hydrology patterns located within or near the location for the Quo Vadis Trailhead could restrict flexibility with regard to facility size and placement.

4.8.5 To Facilities from Transportation

Restricting public access to the Hidden Valley Road, Dutchman Pass Road, Quo Vadis Mine Road, and Rattlesnake Canyon Road would reduce the amount of visitor-created parking areas throughout the NCA. Improved road conditions would increase access and associated use of unimproved areas and planned facilities.

4.8.6 To Facilities from Wildlife Management

Seasonal small-area closures to protect wildlife during critical life periods could delay new construction, increase restrictions, and temporarily hinder access to facilities. Permanent closures to protect wildlife could affect placement of new facilities. Establishing avoidance areas near Special Status Species habitats could restrict placement of new facilities or access roads.

4.8.7 To Facilities from Wildland Fire Management

Although the possibility for fire is low, using appropriate management responses protects aboveground facilities from fire-related damage and reduces the need for associated repair and replacement costs.

4.9 IMPACTS TO LANDS AND REALTY

There are approximately 44 ROWs within the NCA on file in the Las Vegas Field Office. ROWs within the NCA are primarily used for power lines, flood control facilities, access roads, and communications.

Existing ROWs are mainly confined to the northern and eastern portions of the NCA. Valid existing rights are protected under the Sloan Canyon NCA Act. Issuance of new ROWs, permits, and leases may continue within the NCA under the Act, outside the Wilderness, if they benefited the purposes of the NCA.

4.9.1 To Lands and Realty from Visual Resources

Removing the VRM Class IV category and converting the area to VRM Class III (6,596 acres) would impose minor additional design stipulations and siting requirements on ROWs, which could increase construction and maintenance costs. Removing the VRM Class IV category and converting more VRM Class III area to Class II (28,117 acres) would impose moderate design and siting requirements on ROWs, which could increase construction and maintenance costs and make such projects economically infeasible (Figure 2.9). There could be a moderate to major increase in new ROW requests denied as a result of the VRM Class II area.

4.9.2 To Lands and Realty from Lands and Realty

Considering new and amended ROWs on case-by-case basis according to criteria that would benefit the NCA probably would limit additional ROW authorization. Establishing evaluation criteria for new ROWs could decrease the time of processing and clarify standards for ROW applicants.

Limiting film permits to designated trails and trailheads would retain the ability to accommodate filming under greater limitations. However, placing maximums of 15 people per permit would exclude the potential for larger film projects to occur.

4.9.3 To Lands and Realty from Transportation

Restricting registered vehicles to the Dutchman Pass Road, Quo Vadis Mine Road, and Rattlesnake Canyon Road could increase conflicts between ROW maintenance and other users and increase damage or vandalism on adjacent ROWs as visitation increases over the long term.

4.9.4 To Lands and Realty from Vegetation Management

Requiring new or amended ROW holders to improve or restore the natural condition of local native species populations from long-term disturbance could increase installation costs. Evaluating sites for the presence of special status plants before disturbance could affect desired placement of new facilities or access roads, which may increase costs associated with ROW actions.

4.9.5 To Lands and Realty from Wildlife Management

Impacts from establishing a 0.25-mile radius avoidance area to protect artificial and natural waters could have minor restrictions on placement of new ROWs and could restrict access and maintenance activities on new ROWs.

Limiting ROW construction in known bighorn sheep lambing areas could restrict placement of new facilities and access roads (12,860 acres). Limiting surface disturbance in known lambing areas from January through May could delay new facility construction and maintenance activity on ROWs during that time period. Establishing avoidance areas in known nesting areas could restrict placement of

facilities (2,062 acres). Avoiding disturbance in areas of potential Special Status Species habitat, including desert tortoise, could restrict placement, access, and maintenance of facilities.

Seasonally restricting ROW construction within a radius surrounding occupied raptor nesting sites could delay facility construction and maintenance activity on ROWs. Restriction areas would be determined on a case-by-case basis and depend on factors such as species and nesting location. Seasonal small-area closures to protect wildlife during critical life periods could delay ROW construction and hinder access to new sites.

4.9.6 To Lands and Realty from Wildland Fire Management

Although the possibility for fire is low in the NCA, using appropriate management responses protects aboveground facilities from fire-related damage and reduces the need for associated repair or replacement costs.

4.10 IMPACTS TO TRANSPORTATION (REGISTERED MOTORIZED VEHICLES)

4.10.1 To Transportation from Recreation

The completion of the North McCullough and Anthem Trails would attract visitors to the North McCullough Road, when it was constructed, and would have long-term impacts on the numbers of vehicles traveling the road. The use of this road could also increase if additional trails and trailheads were constructed in the future.

Designating mountain bike and equestrian trail areas near the Quo Vadis trailhead could increase traffic on the designated roads.

4.10.2 To Transportation from Facilities

Constructing trailheads and staging areas at Dutchman's Pass and Quo Vadis Mine would increase usage of the Dutchman Pass Road, the Quo Vadis Mine Road, and Rattlesnake Canyon Road. Currently, these roads are infrequently used, but as NCA visitation increased, moderate impacts could occur due to user conflicts and road degradation.

4.10.3 To Transportation from Transportation

Designating the Dutchman Pass Road, the Quo Vadis Mine Road, and Rattlesnake Canyon Road as open for registered motorized vehicle travel would allow access to interior portions of the NCA. However, designating only these roads would likely have major impacts for road maintenance requirements and to structures and traffic control. In addition, conflicts between vehicles and hikers, bikers and other types of recreational users may increase.

The City of Henderson's North McCullough Road, when constructed, would be open for public travel and would likely be heavily used to access the interior of the northern portion of the NCA.

4.11 IMPACTS TO VEGETATION MANAGEMENT

Impacts to vegetation, including Special Status Species and their habitats, are described in terms of an increase or decrease in disturbance (i.e., soil compaction, accelerated soil erosion, damage to biological soil crusts, removal of vegetation). This impact is a result of surface-disturbing or other disruptive activities (e.g., vehicle contact, construction of trails, road improvements, and utility corridors). Associated impacts on the potential for establishment or spread of invasive plant species and the condition of the vegetation resource, including special status plant species, also are discussed.

4.11.1 To Vegetation from Recreation

Allowing primitive and dispersed camping throughout the NCA, excluding the Petroglyph Management Area, could result in short-term impacts from removal or trampling of vegetation. Restrictions on camping could offset the degree of disturbance, however, and impacts probably would be minor.

Construction of trails within the NCA would result in loss of vegetation because of clearing. However, avoiding trail development in sensitive resource areas would minimize impacts on sensitive vegetation habitat (e.g., Special Status Species habitat, areas prone to erosion). Restoration of unauthorized constructed and social trails within the NCA would decrease the likelihood that these disturbed areas would become dominated by invasive plant species and would improve the condition of the vegetative resource in these areas by reducing fragmentation of the vegetation community and improving population viability over the long term.

Closing the NCA to OHV and restricting mountain bike use to designated trails would decrease disturbance of vegetation associated with these uses (i.e., soil compaction, accelerated soil erosion, damage to biological soil crusts, removal of vegetation), resulting in decreased establishment or spread of noxious or invasive weeds. This action also would indirectly maintain or improve the condition of vegetative resources through reduction of fragmentation of existing habitat and maintenance of existing plant structure and percent cover, especially of species that would be sensitive to trampling (i.e., white bursage). These impacts would be minor to moderate.

4.11.2 To Vegetation from the North McCullough Wilderness

Use of the minimum requirement and minimum tool analysis approach in response to wildfire could minimize disturbance of vegetation from wildfire response activities; however, if the minimum-tool approach proved to be inadequate for a particular wildfire, allowing the wildfire to grow larger, disturbance of vegetation would increase.

Developing permanent facilities within the North McCullough Wilderness would result in a potential localized loss of vegetation if a previously undisturbed site was chosen. Allowing only minimal permanent facilities would minimize this disturbance, however.

Restoration of human-caused disturbances and alterations (e.g., establishment of noxious or invasive weeds) within the Wilderness would decrease the likelihood that disturbed areas would become dominated by invasive plant species. Disturbance associated with restoration efforts would occur, however, if mechanized tools were used.

Allowing primitive and dispersed camping throughout the Wilderness, excluding the Petroglyph Management Area, could result in short-term impacts from removal or trampling of vegetation. Campfire fuel restrictions would reduce incidents of vegetation removal. Restrictions on camping could minimize

disturbance, however, and impacts probably would be minor. Furthermore, designation of hiking and equestrian trails for resource protection would minimize disturbance to vegetation associated with use of trails. Construction of trails from Hidden Valley to the Petroglyph Management Area would result in loss of or damage to vegetation. Dispersal of recreation use that could otherwise result in social trails to other areas (using area closures, barriers, and visitor information) also would minimize disturbance associated with social trail use.

4.11.3 To Vegetation from Facilities

Development of visitor facilities, including parking areas, would result in a permanent localized loss of vegetation at development sites if previously undisturbed sites were chosen. However, these impacts would be larger because of the greater amount of disturbed area. Landscaping of developed areas using only plant species native to the NCA would reduce the spread or establishment of noxious or invasive species in these disturbed areas by reducing the potential spread of non-native species that could out compete native species, preserving genetic diversity.

4.11.4 To Vegetation from Lands and Realty

If applications for ROWs were considered on a case-by-case basis and a reduction in disturbance was a consideration of approval, disturbance associated with new and amended ROWs would be minimized and probably would result in only minor impacts.

4.11.5 To Vegetation from Transportation

Authorization of motorized vehicles for installing, maintaining, and reconstructing water development projects could result in increased disturbance of vegetation from trampling and increased establishment or spread of noxious or invasive weeds.

4.11.6 To Vegetation from Vegetation Management

Any efforts to survey, monitor, and manage noxious or invasive plant species in the NCA would decrease establishment or spread of noxious or invasive weeds, which could indirectly increase habitat productivity, species diversity, and disease and pest resistance and result in long-term maintenance or improvement of the condition of vegetative resources (e.g., habitat productivity, species diversity, disease/pest resistance, percent cover). The degree of impact could be minor or major, depending on the level of eradication and prevention activities.

Promotion of native plant communities and restoration of disturbed areas in all MEAs would decrease the potential for the spread of noxious or invasive weeds, which would directly result in increases in habitat productivity, species diversity, and disease and pest resistance of vegetation. However, allowing disturbed areas in the North McCullough Wilderness to be restored through natural processes would increase the likelihood that disturbed areas would become dominated by invasive plant species. Landscaping of all developed areas within the NCA using only plant species that were native to the NCA would result in enhanced long-term maintenance of the condition of the vegetative resources of the NCA by limiting the opportunity for non-native species to be established within the NCA.

Improving or restoring to natural conditions any surface disturbance in all MEAs that exceeded the thresholds of disturbance adversely affecting native plant communities would decrease the likelihood that disturbed areas would become dominated by invasive plant species; fragmentation of the vegetation community also would be reduced over the long term. Setting the threshold of disturbance for

nonmotorized MEAs to include short-term impacts would further decrease the likelihood that these areas would become dominated by invasive species.

Prohibiting casual and commercial collection of vegetation in the NCA could maintain or improve vegetative condition by retaining mature plants and seeds and preserving population viability and genetic diversity. Because unlawful collections could still occur, however, the impacts related to the prohibition of casual and commercial collection probably would be minor and localized.

Restoration and rehabilitation of disturbed areas in the North McCullough Wilderness using a minimum requirement and minimum tool analysis approach would decrease the likelihood that disturbed areas would become dominated by invasive plant species.

Minimizing impacts to native plant communities in all MEAs adversely affected by surface disturbance would decrease the potential for the spread of noxious or invasive weeds, but to a more limited degree than direct improvement or restoration of these areas. Setting the threshold of disturbance for nonmotorized MEAs to include short-term impacts would further decrease the likelihood that these areas would become dominated by invasive species. Allowing some collection, particularly commercial collection, of vegetation within the NCA, outside the Wilderness, would have minimal impacts.

Avoiding Special Status Species when conducting surface-disturbing activities would maintain the condition of these species and their habitats. Conversely, surface disturbance would cause impacts to Special Status Species populations and habitat, particularly habitat degradation and reduction of habitat.

4.11.7 To Vegetation from Wildlife Management

Avoiding disturbance or development in habitats of Special Status Species and mitigation of disturbance discovered in these areas would indirectly improve the condition of the vegetation resource in those areas. The impacts on these species would be moderate to major.

4.11.8 To Vegetation from Livestock Grazing

Permitting livestock grazing in the Hidden Valley Allotment could result in minor localized increases in disturbance of vegetation (e.g., accelerated soil erosion, removal of vegetation, change in species composition) and establishment or spread of noxious or invasive weeds related to domestic animal use; however, the disturbance should be minimized by adherence to the *Mojave-Southern Great Basin RAC Rangeland Health Standards and Guidelines for Livestock Grazing Management* (BLM 1997), including allotment-specific objectives.

4.12 IMPACTS TO WILDLIFE MANAGEMENT

The NCA encompasses an ecologically diverse region with a variety of land forms, soil types, and vegetation communities. This variability creates habitat for numerous wildlife species, including mammals, birds, and reptiles. No known fish, mollusks occur within the NCA. Management of wildlife includes not only general wildlife species and their habitat but species and habitat that are protected under the Endangered Species Act, species identified as Nevada BLM-sensitive species, or state species of concern.

The BLM would continue to manage wildlife habitat in coordination with NDOW, and it is assumed that sufficient habitat would exist to maintain NDOW wildlife population management objectives. It is assumed that designated hiking trails within the NCA would receive greater overall visitor use than cross-

country hiking areas because of their ease of use by a wider array of user types and their proximity to populated areas. It also is assumed that northern portions of the planning area would receive a greater amount of human use because of the close proximity of populated areas and available access.

4.12.1 To Wildlife from Recreation

Designating approximately 18,000 acres as semi-primitive nonmotorized MEA would result in increased preservation of wildlife habitat characteristics in the NCA because of avoidance of facility construction and prohibition of motorized use.

Limiting hiking to designated trails, once constructed, in areas bordering the northwestern portion of the NCA where there would be increased access and proximity to populated areas would reduce effects on wildlife by concentrating human presence, including the likelihood that wildlife could become habituated to humans in those areas. The level of disturbance would depend on the location of a designated trail relative to sensitive wildlife habitat and the amount of visitor use on designated trails. Facilities associated with the trail system might result in a slight increase in human disturbance to wildlife from concentrated human presence.

Limiting equestrian use to designated trails, once constructed, in the northern portion of the NCA where there would be increased access and proximity to populated areas would reduce effects on wildlife by concentrating human presence, including the likelihood that wildlife could become habituated to humans in these areas. The location of the designated area would be outside the majority of sensitive bighorn lambing and raptor nesting areas.

Limiting mountain biking to designated multiple-use trails and vehicle roads would result in a large reduction in effects on wildlife from vegetation trampling and human disturbance. Limiting primitive and dispersed camping to the southern portion of the NCA would result in a reduction of impacts of vegetation trampling and human disturbance. Limiting bouldering and traditional rock climbing (no permanent anchors) to areas outside sensitive resource areas in the NCA would result in a large reduction of human disturbance effects on wildlife, particularly in bighorn sheep lambing and raptor nesting areas. Prohibiting dogs in 75 percent of the NCA would provide strong resource protection but eliminate recreational opportunities for dog owners. Near the most populated areas (25 percent of the NCA), dogs could still come to the NCA, but only on a leash, and on trails, once trails were constructed and being used.

Closing the entire NCA to OHV use would result in long-term preservation of habitat characteristics and elimination of direct mortality of animals and indirect noise and disturbance from human presence associated with OHV use.

4.12.2 To Wildlife from Petroglyph Management Area

Limiting visitor use of the Petroglyph Management Area to the canyon bottom and a limited number of designated trails would reduce overall effects of human disturbance on wildlife. However, such action could still result in temporary indirect noise and disturbance to nesting raptors from increased visitor use. Construction also could result in introduction of noxious or invasive weeds that could result in modification of wildlife forage base.

4.12.3 To Wildlife from the North McCullough Wilderness

The BLM would manage access to the existing North McCullough Slickrock Catchment #1 (Maintenance Project #4916, also known as the Poppy big game guzzler) in accordance with the MOU with NDOW (BLM 2003c), which would continue to sustain viable wildlife populations in the Wilderness.

Allowing hiking and equestrian use throughout the Wilderness could result in temporary indirect disturbance on wildlife from dispersed human presence and may result in decreased reproductive fitness for bighorn sheep, alteration of raptor distribution and breeding, and alteration of wildlife habitat. The level of disturbance would depend on the amount of visitor use within the area and probably would be greater in the northern portions of the planning area because of increased access and proximity to populated areas.

Prohibiting dogs throughout the Wilderness would provide strong resource protection although it could limit recreational opportunities for dog owners.

4.12.4 To Wildlife from Cultural Resources

Managing cultural sites under Section 106 and appropriate guidance when these sites were threatened by land-disturbing activities could result in long-term protection of wildlife habitat characteristics because of the nature of preserving the location and integrity of cultural sites.

4.12.5 To Wildlife from Visual Resources

Designating the Wilderness as VRM Class I and 27,000 acres as VRM Class II would protect bighorn lambing areas and other wildlife habitat through a low level of change to the characteristic landscape.

4.12.6 To Wildlife from Facilities

Development of a management program that would strive to achieve a litter-free NCA would provide protection of sensitive wildlife populations, particularly desert tortoise, from introduction of new predators and non-native species that may be attracted to litter in the NCA. Because of the proximity of the NCA to the City of Henderson, an increased likelihood of illegal dumping and random litter deposition would exist. Ravens, coyotes, and feral dogs and cats tend to be attracted to readily available food sources that can be contained in litter depositions. These species would pose a threat to all wildlife populations within the NCA by preying on eggs and juveniles; they would be of particular concern, however, to the desert tortoise. The common raven has been the foremost predator of desert tortoise juveniles because of large increases in raven populations from increased food supplies near urban areas (e.g., roadkill, trash, and garbage dumps), including new sites for perches and nests (e.g., fences, buildings, power poles, and towers) (NPS 2004; Nature Conservancy and Nevada Field Office FWS 2002).

Construction of a visitor center near the NCA boundary at the north entrance to Sloan Canyon, a parking lot inside the NCA boundary at the Hidden Valley Trailhead, a parking lot and an equestrian staging area near the northeastern boundary of the NCA at the Dutchman Pass Trailhead, and an half-acre parking lot at the Quo Vadis Trailhead would result in minor permanent loss of sparse creosote and grassland habitat, which is common in the NCA. Increased human presence in these areas would result in minimal disturbance because of their location near the NCA boundary, outside the sensitive wildlife habitat.

4.12.7 To Wildlife from Lands and Realty

No authorization of new communication sites would eliminate possible loss of habitat and disturbance from site maintenance.

4.12.8 To Wildlife from Transportation

Authorizing motorized vehicles for installing, maintaining, and reconstructing water development projects, including guzzlers, would maintain or enhance wildlife populations by ensuring a means to install and maintain water development projects.

Allowing registered motorized vehicle use only on the Dutchman Pass Road, Quo Vadis Mine Road, and Rattlesnake Canyon Road would concentrate noise, disturbance, and traffic accident impacts in these areas, but remove the opportunity for these interactions from the remainder of the NCA.

4.12.9 To Wildlife from Vegetation Management

Continuing ongoing efforts to map, monitor, and eradicate invasive plant species could minimize the spread of noxious or invasive species, which would result in long-term preservation of natural wildlife habitat characteristics within the NCA.

Managing vegetation in all MEAs to promote native plant communities and restore the plant productivity of disturbed areas through rehabilitation or revegetation would result in long-term restoration of wildlife habitat.

4.12.10 Impacts from Wildlife Management

Maintaining or improving current and potential wildlife habitat toward full ecological potential would provide for long-term protection and improvement of wildlife habitat characteristics. Managing recreation development and construction, including trails, near wildlife water developments with a 0.25-mile radius avoidance area would greatly reduce potential wildlife displacement from or abandonment in areas where trails were located near sensitive wildlife habitat.

Prohibiting commercial collection of reptiles and any surface disturbance associated with this collection would reduce potential decreases in wildlife abundance.

4.12.11 To Wildlife from Wildland Fire Management

Providing fire suppression efforts commensurate with resource and adjacent property values at risk could preserve wildlife habitat characteristics.

4.12.12 To Wildlife from Livestock Grazing

Management of the range consistent with the requirements of key perennial species would maintain wildlife habitat characteristics within the NCA.

4.13 IMPACTS TO AIR QUALITY

This section presents impacts to air quality from other management actions. This analysis is qualitative; however, if specific activities are proposed, at the implementation stage impacts to air quality would be compared to the National Ambient Air Quality Standards (NAAQS) or Nevada Ambient Air Quality Standards to ensure regulatory compliance and compliance with Clark County State Implementation Plans.

4.13.1 To Air Quality from Facilities

Actions associated with construction of facilities within the NCA would be contributors to particulate matter (PM)₁₀ emissions. These activities are short term in nature and would have to be conducted in compliance with *Clark County State Implementation Plan* (SIP) requirements and local dust control regulations.

4.13.2 To Air Quality from Lands and Realty

The various construction activities authorized under lands and realty (e.g., communication sites, transmission lines) would produce emissions of PM₁₀. Soil disturbance and travel on unpaved roads would be the main causes of these emissions. Tailpipe emissions from vehicular travel and emissions from equipment use also would occur. Minimal lands and realty activities are anticipated, however. All such activity would have to be in accordance with Clark County SIP and local dust control regulations.

4.13.3 To Air Quality from Transportation

Use of heavy equipment on unpaved roads for administrative purposes would cause emissions of carbon monoxide (CO) and volatile organic compounds (Voss). Maintenance of unpaved roads and shoulders of paved resource roads would cause PM emissions and tailpipe emissions. Emissions of particulate matter from road graders and heavy equipment operations would occur, but are short term in nature and present no long-term impacts to the NCA.

4.13.4 To Air Quality from Vegetation Management

Trucks and heavy equipment (bulldozers, etc.) used in vegetation management and control would cause dust from unpaved roads. Areas receiving vegetation treatment would add short-term increases in PM₁₀ until vegetation recovered sufficiently to stabilize exposed soil. These emissions would be considered minor, however, and vegetation activity using heavy equipment would have to be conducted in accordance with Clark County SIP and local dust control regulations.

4.13.5 To Air Quality from Wildland Fire Management

Wildland fires could cause short-term emissions of Nitrogen Oxide (NO), Sulfur Dioxide (SO)₂, VOC, PM₁₀, and CO that could be spread over large portions of the area, depending on the size of the fire and wind conditions. In addition, PM₁₀, CO, NO, and Voss (which include hazardous air pollutants [HAP]) could result from use of heavy equipment during fire suppression activities. These impacts would be minor and short-term in nature because fire risk within the NCA is minimal.

4.13.6 To Air Quality from Air Quality

Impacts to air quality would result from activities causing exhaust emissions and fugitive dust, such as driving on designated roads; however, these impacts would be minor. Specific air quality mitigation actions would be developed on a case-by-case basis as part of activity specific plans and permits. For example, planned construction activities would be temporary in nature and would fall under section 94 of the Clark County Department of Air Quality and Environmental Management regulations. Any construction disturbance greater than 1/4 acre would require a valid dust control permit from the DAQEM, which would stipulate best management practices and dust control measures.

4.14 IMPACTS TO LIVESTOCK GRAZING

Impacts to livestock grazing operations would occur if such actions disrupted livestock movement, resulted in loss of forage such that the livestock operator or permittee would have to reduce operations, or increased human disturbance and harassment of livestock. Most of the actions contained in the management plan would not impact livestock operations. Actions that do impact livestock operations could have minor impacts, as described in this section.

4.14.1 To Livestock Grazing from Vegetation Management

Protection of plants designated as Special Status Species and their habitats occurring within the allotment would restrict livestock from grazing in those areas. However, because very few, if any, special status plant species currently exist within the allotment, the impacts would be negligible to minor.

4.14.2 To Livestock Grazing from Livestock Grazing

Prohibiting salt and mineral placement within the NCA could decrease concentrated areas of livestock grazing within the NCA that would be typically associated with salt and mineral placements. No new range improvements within the NCA could cause a negligible decrease in the amount of forage available to livestock.

4.15 IMPACTS TO SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

This section summarizes socioeconomic impacts associated with resource management changes for the Sloan Canyon NCA. Socioeconomic impacts tend to result from the totality of management actions for a particular resource.

Along with wildlife, vegetation, and the physical environment, people are an integral part of ecosystems. Lifestyles, attitudes, beliefs, values, social structure, culture, and population characteristics affect, and are affected by, management actions such as those made by BLM for the NCA. In addition, BLM lands and BLM management of these lands have emotional meanings to many people. The social and cultural impacts of the management plan are addressed qualitatively, using best professional judgment based on the available information.

Most socioeconomic impacts of the proposed plan are expected to be negligible or minor, although impacts could range to major for user groups, for example OHV users.

4.15.1 To Socioeconomics from Recreation

Demand for recreational use of the NCA is highly likely to increase because of the following factors:

- Publication in local and regional tourist information media would heighten public awareness.
- The growing population of Clark County would result in increased demand.
- Loss of open space as Clark County grows would focus many recreational demands on remaining open spaces.
- Designation of the NCA would further attract recreational users. Notable aspects of the NCA, such as the Sloan Canyon Petroglyph Site and the presence of desert bighorn sheep, are likely to be special draws for visitation.
- The growing population of active senior (older than age 55) residents in the City of Henderson would place increased demands on the Sloan Canyon NCA.
- Development of lands close to the boundaries of the NCA would result in increased use from surrounding neighborhoods.

Without effective management of recreational use of the Sloan Canyon NCA, as demands increase so too would conflicts between visitors with different objectives and desires for different recreational experiences. Development of facilities could improve the quality of the recreational experience and could draw visitors from outside Clark County, resulting in a net economic stimulus (increased income and employment).

Fees could be charged in some areas of the NCA. Fees could have a minor impact on the ability of some individuals to use the NCA. Annual passes that reduce access costs for frequent users could be considered.

Under the proposed plan, mountain biking, equestrian activity, rock climbing, and rock hounding would be allowed, with certain controls—such as limitation to or exclusion from certain trails or areas. This could impact some users by limiting or changing their historical use of the NCA; however, trails and formal access areas would likely encourage many more users to visit the NCA. Prohibiting OHV use would have major effects on the user group and their use of the NCA.

Prohibiting dogs in 75 percent of the NCA would provide strong resource protection although it could limit recreational opportunities for dog owners. In designated areas of the NCA, dogs, on lead, could still accompany owners.

Requiring guided visitation during high-use periods and limiting the issuance of permits at other times could reduce visitor's flexibility for visiting the Petroglyph Management Area. This may have minor impacts on historical users.

4.15.2 To Socioeconomics from Facilities

The moderate level of proposed facility development, including a visitor center, would increase the quality of experience for most visitors and would provide a minor economic stimulus. Minor short-term increases in net economic activity would occur because of the infusion of construction spending. Over the long term, recreational spending (gas, hotels, food and beverages, charges for goods and services

offered by commercial outfitters or vendors operating under special recreation permits, etc.) by visitors from outside Clark County would result in a minor net economic stimulus.

4.15.3 To Socioeconomics from Lands and Realty

The Sloan Canyon NCA Act recognizes existing rights and places limitations on new ROWs and amendments. Existing communication ROWs would be renewed at the end of their term, and other existing ROW grants may be renewed at the end of their term. In either case, the ROWs may be modified to meet the intent of the Sloan Canyon NCA Act. Existing communication sites would remain as authorized. These management actions probably would maintain economic activity associated with the ROWs and could increase or decrease any conflicts with other user groups (e.g., aesthetic issues of communications sites for visitors seeking a primitive or semi-primitive experience), contingent on the locations and designs of the ROWs and any modifications.

Amendments and ROWs would be considered on a case-by-case basis, which could allow for new economic activity and could result in conflicts with other user groups. To the extent that any denied ROWs would result in routing of utilities surrounding the NCA, the additional costs of doing so would constitute an economic impact, with the degree of impact contingent on the types and lengths of utilities involved. These effects would be based on the directive of the Sloan Canyon NCA Act, however, not decisions contained in this PRMP. No new communication sites would be authorized, which could result in forgone economic activity. Film permits would be issued on a limited basis, which could allow for minor increases in economic activity.

4.15.4 To Socioeconomics from Transportation

Four roads would be open to motorized registered vehicles; all other roads and routes would be closed. This action would have a minor to moderate impact on elderly and handicapped users who desire or require motorized access to the NCA.

4.15.5 To Socioeconomics from Livestock Grazing

The proposed plan would provide for continued grazing use of the Hidden Valley Allotment. If the permittee voluntarily relinquished grazing privileges, permits, or leases, however, the allotment could be closed to further livestock grazing. A minor reduction in opportunities for local ranchers to maintain the ranching culture and lifestyle would occur if the permit were retired.

4.15.6 Environmental Justice

Executive Order 12898 regarding Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations requires that disproportionately high and adverse human health and environmental impacts of Federal programs, policies, and activities on minority or low-income populations be identified and addressed. Neither Clark County nor any of the five U.S. Census Bureau census tracts containing or surrounding the NCA:

- Have minority or low-income populations exceeding 50 percent
- Have a percentage of minority or low-income population that is 10 percent or greater than the figures for the state of Nevada.

Executive Order 12898, also requires BLM to consider impacts to the traditional lifestyle of a minority communities and archeological sites representing the ancestors of a minority community. For these

reasons, the BLM conducted an extensive planning process to identify interested Native American tribes, included them in the identification and evaluation of the NCA's cultural resources, and conducted an ethnographic survey. The Sloan Canyon NCA is known to contain one site of major interest to the region's Native Americans—the Sloan Canyon Petroglyph Site.

The proposed plan provides for and encourages consultation with Native Americans on issues that may affect Native American values and traditions. As provided for by law, provision has been made for the use of NCA lands and resources for traditional ceremonial purposes. As opportunities arise, Native American partnerships would be developed to enhance and improve cultural exhibits and to provide improved education on Native American issues for NCA visitors.

4.16 CUMULATIVE IMPACTS

Cumulative impacts are effects on the environment that result from the impact of implementing the proposed plan in combination with other actions outside the scope of this plan, either within the Sloan Canyon NCA or outside it. Cumulative impact analysis is required by Council on Environmental Quality (CEQ) regulations because environmental conditions result from many different factors that act together. The total effect of any single action cannot be determined by considering it in isolation but must be determined by considering the likely result of that action in conjunction with many others. Evaluation of potential impacts considers incremental impacts that may occur from the proposed project, including impacts from past, present, and reasonably foreseeable future actions (RFFA). Management decisions may be influenced by activities and conditions on adjacent public and nonpublic lands beyond the NCA boundary. Therefore, assessment data and information may span multiple scales, land ownerships, and jurisdictions. These assessments involve determinations that often are complex and, to some degree, are subjective.

4.16.1 Cumulative Analysis Methodology

The cumulative impacts discussion that follows considers the proposed plan in context of the broader human environment—specifically, actions that would occur outside the scope and geographic area covered by the RMP. Cumulative impact analysis is limited to important issues of national, regional, or local significance. Therefore, not all resources identified for the direct and indirect impact analysis in this EIS were analyzed for cumulative impacts.

Because of the programmatic nature of an RMP and cumulative assessment, the analysis tended to be broad and generalized to address potential effects that could occur from a reasonably foreseeable management scenario combined with other reasonably foreseeable activities or projects. As a result, this assessment was primarily qualitative for most resources because of lack of detailed information that would result from project-level decisions and other activities or projects. However, quantitative information was used whenever available and as appropriate to portray the magnitude of an impact. The analysis assessed the magnitude of cumulative impacts by comparing the environment in its baseline condition to that with the expected impacts of the proposed plan and other actions in the same geographic area. The magnitude of an impact was determined through a comparison of anticipated conditions against the naturally occurring baseline as depicted in the Affected Environment chapter or the long-term sustainability of a resource or social system.

The following factors were considered in this cumulative impact assessment:

- Federal, nonfederal, and private actions
- The potential for synergistic effects or synergistic interaction among or between effects

- The potential for effects to cross political and administrative boundaries
- Other spatial and temporal characteristics of each affected resource
- The comparative scale of cumulative impacts across the proposed plan.

4.16.2 Temporal and Spatial Boundaries

Temporal and spatial boundaries used in the cumulative analysis were developed on the basis of resources of concern and actions that might contribute to an impact. The baseline date for the cumulative impacts analysis was November 2002, which was when the NCA was established under the Sloan Canyon NCA Act. The temporal scope of this analysis is the life of this RMP, which encompasses a 20-year planning period.

Spatial boundaries varied and were larger for resources that were mobile or would migrate (for example, desert bighorn sheep populations) compared to resources that were stationary. In some cases, spatial boundaries might be contained within the NCA or an area of the NCA.

4.16.3 Past, Present, and Reasonably Foreseeable Future Actions

Past, present, and potential future actions were considered in the analysis to identify whether the environment had been degraded or enhanced and to what extent; whether ongoing activities were causing impacts; and trends for activities and impacts in the area. Projects and activities were evaluated on the basis of proximity, connection to the same environmental systems, potential for subsequent impacts or activity, similar impacts, the likelihood a project would occur, and whether the project was reasonably foreseeable.

Projects and activities considered in the cumulative analysis were identified through meetings held with cooperators and those BLM employees with local knowledge of the area. Cooperators and the BLM employees were asked to provide information on the most influential past, present, or reasonably foreseeable future actions. Additional information was obtained through discussions with agency officials and review of publicly available materials and websites.

Effects of past actions and activities have been manifested in the current condition of the resources, as described in the Affected Environment, Chapter 3. RFFAs are future actions that have been committed to or known proposals that could take place within the 20-year planning period. RFFA scenarios are projections made only for the prediction of future impacts; they are not actual planning decisions or resource commitments. Projections—which have been developed for analytical purposes only—are based on current conditions and trends and represent a best professional estimate. Unforeseen changes in factors such as economics, demand, and federal, State, and local laws and policies could result in different outcomes than those projected for this analysis.

Other potential future actions have been considered and eliminated from further analysis because there was only a small likelihood that these actions would be pursued and implemented within the life of the plan or because there was so little known about the potential action that formulating an analysis of impacts would be premature. In addition, potential future actions that would be protective of the environment (such as new potential threatened or endangered species listings or regulations related to fugitive dust emissions) would have little likelihood of creating major environmental consequences alone or in combination with this planning effort. Federal actions such as species listing would require BLM to reconsider decisions created from this plan because the consultations and relative impacts might no longer be appropriate. These potential future actions might have greater capacity to affect resource uses within

the Sloan Canyon NCA; until more information has been developed, however, no reasonable estimation of impacts could be developed.

Data on the precise locations and overall extent of resources within the Sloan Canyon NCA are considerable, although the information varies according to resource type and locale. Furthermore, understanding the impacts on and the interplay among these resources is evolving. As knowledge improves, management measures (adaptive or otherwise) would be considered to reduce potential cumulative impacts in accordance with law, regulations, and the RMP for the NCA.

4.16.4 Cumulative Impacts By Resource Category

Resource areas that have potential for cumulative impacts include the following: recreation, cultural, visual, lands and realty, vegetation, wildlife, and socioeconomics. Cumulative impacts are discussed only for resources or uses that might experience impacts. The other resources and uses would be expected to have negligible cumulative impacts and are not discussed.

Recreation

The cumulative impact boundaries for recreation include the NCA and Clark County. Development and population growth in the Las Vegas Valley and the City of Henderson is expected to increase casual recreation use in the urban interface. Increasing population growth would create a greater need for public land recreation. These trends are fostered by approximately 70,000 additional acres of BLM public lands potentially available for sale and development through 2018 and the Sloan Canyon NCA Act and improved transportation systems, including the Ivanpah Corridor near the NCA and McCullough Pass Road and Trail through the northern portion of the NCA. Development of the Ivanpah Airport, Ivanpah Corridor, and high-speed rail line would be likely to lead to additional tourism, development pressure, and associated recreation demand adjacent to the Sloan Canyon NCA. Although monitoring suggests that the current visitation to the Sloan Canyon NCA averages approximately 25,000 visitors annually, additional development and population growth adjacent to the boundaries probably would induce increased visitation and associated resource damage. Increased recreational demand adjacent to residential and urban areas would have major cumulative impacts on NCA facilities and resources and on visitor recreation experiences. As population grows, illegal recreation activities such as casual target shooting, trash dumping, auto stripping, and driving on undesignated roads would continue to occur in remote public lands and would increase in relation to growth and development. Increased recreation could lead to decreased quality in the recreation experience from increased vandalism and surface disturbance, overcrowding, displacement to areas that have received limited use in the past, and increased user conflicts in the long term.

The range of recreation opportunities near urban areas also would be cumulatively reduced under the public land disposal, NCA, and Wilderness designations, including by sprawling development. Limits on and loss of opportunities would cause a shift of recreation use to other areas and reduce options available for current and future users, which might place greater demand on accessible BLM public lands. Disposal areas, past designations, and residential development would induce a shift from public land casual use to directed-use recreation, including developed facilities, trails, and community recreation areas, resulting in a cumulative loss of recreational freedom near urban areas.

Cumulative increases in development surrounding the Sloan Canyon NCA might detract from the visitor experience over time. Increased use of flight paths over remote public lands associated with the new Las Vegas heliport, the Henderson Executive Airport expansion, and the proposed Ivanpah Airport would create cumulative impacts that could include diminished visitor solitude and decreased quality of

recreation experiences. Mining activity, power plants, and power lines and infrastructure create visual intrusions that could detract from the visitor experience in the NCA and the Wilderness. Given the protective direction of the Sloan Canyon NCA under the Sloan Canyon NCA Act, RMP management actions attempted to preserve the visitor experience from these external activities.

Cultural Resources

The cumulative impact boundary for cultural resources includes the NCA and Clark County. Cultural resources within the NCA include 144 sites surveyed to date containing various types of cultural resources. Cumulative indirect impacts to cultural resources would likely be a result of population growth, and the cumulative ground disturbance of projects and activities listed in Section 4.16.3 Past, Present and Reasonably Foreseeable Future Actions; and cumulative impacts to recreation patterns described in Section 4.16.4, Recreation. Long-term cumulative increases in visitor use and outdoor recreation within the NCA would increase the probability and frequency of the types of impacts described in *Section 4.4 Impacts to Cultural Resources*. Cumulative impacts to cultural resources could include theft, vandalism, accidental damage, or unknowing damage.

Approximately 5,000 acres have been developed annually in Clark County from 1970 to 2003, and the BLM Disposal Final Environmental Impact Statement (EIS) assumes that this rate will continue in the Las Vegas Valley through 2018. Because this development might impact cultural resources, the protections and management proposed under this plan would provide an overall cumulative impact to remaining cultural resources valued by Native Americans and others within the Las Vegas Valley, and increase the importance of traditional Tribal use of the Sloan Canyon Petroglyph Site.

Visual Resources

The cumulative impact boundary for visual resources included key observation points from the NCA and areas within Clark County from which the NCA would be potentially visible. As development continues in the Las Vegas Valley and in close proximity to the NCA, particularly on the northern boundary, views from within the NCA are becoming more urban. Although some areas within the NCA have natural obstructions, such as canyon walls, many of the recreational and visitor use areas do have views of urban development. Because most visitors focus on views into the mountains within the NCA, however, viewer impacts would be minor.

Lands and Realty

The cumulative impact boundary for lands and realty includes the NCA, Clark County, and major ROW corridors that intersect the NCA. Development and additional power plants would place a greater demand on lands and realty actions in and outside the NCA, creating the need for additional ROWs for power lines and supporting development. The Sloan Canyon NCA Act is more restrictive on placement of future ROWs, however. Restrictions on ROWs in the NCA and the Wilderness, combined with restrictions from other management plans in the area, would have a major effect by reducing routing options and increasing construction costs for utilities.

Vegetation

The cumulative impact boundaries for vegetation include the NCA, watershed boundaries extending outside the NCA, and contiguous geologic formations. An increase in development and population growth in close proximity to the NCA would increase visitor use within the NCA. This increase in visitor use, along with new facility, road, and trail development within the NCA, could cause a cumulative loss

of native vegetation and an increase in the number of species and acres with non-native plant species. Special Status and sensitive plant species also could be affected through loss of habitat in and surrounding the NCA for such species.

Wildlife

The cumulative impact boundaries for wildlife extend beyond the NCA to include landforms, soil types, and vegetation communities in Clark County that provide forage sources, habitat and locations of water for reptile, bird and mammal species listed in the Affect Environment chapter. Major cumulative impacts to wildlife are expected to continue in the Las Vegas Valley from the increasing trend of residential development and resulting recreation use. Increased human habituation and visitation is encroaching into the areas, including the NCA, used by wildlife, leading to permanent loss of habitat; increased habitat degradation and fragmentation; displacement; increased disturbance and direct mortality from roadkills, predation, disease and drought.

The combination of increased human habituation and recreation use may also lead to major cumulative impacts to reptile populations if harvest and collection trends continue. Although within the NCA boundaries the collection of wildlife is only allowed for scientific purposes with a permit, collection of wildlife outside of the NCA might reduce the viability of wildlife populations in the area. Effects from reduced population viability would particularly critical for Special Status Species and sensitive species, particularly those with limited home ranges or low reproductive and recruitment rates. Mining activity south of the NCA would pose concern with regard to the threatened desert tortoise, and a loss of habitat for desert bighorn sheep, Gila monsters, and chuckwallas. This could reduce the viability of populations that exist within an area and increase the possibility of local population extinctions within the NCA. The proposed plan increases protections for wildlife species and habitat within the NCA. In addition, direction provided by the Clark County Multiple Species Habitat Conservation Plan (MSHCP) and increase attention to wildlife management areas and recovery units being set aside in southern Nevada to protect Special Status Species and sensitive species would be likely to reduce the intensity of these impacts.

Cumulative increases in power plants, power lines, and supporting infrastructure throughout the area might lead to increased surface disturbance and supporting roads, resulting in additional habitat fragmentation and a loss of wildlife habitat. This could reduce the viability of wildlife populations that use the NCA and surrounding area. Species that would require large areas of habitat might be more vulnerable to the loss of local populations. Construction activity and use of the North McCullough Road and Trial in the northern portion of the NCA could fragment the northern extent of a bighorn sheep lambing area. Concentrated use in the areas might displace bighorn sheep and disrupt reproductive cycles, reducing the viability of populations within the NCA and surrounding area. These factors, in combination, contribute to reduced population viability and might decrease native species biodiversity in the long term. The Wilderness and the southern portion of the NCA would receive limited use and experience fewer disturbances to wildlife species and habitat. As a result, management actions in the NCA are not expected to contribute to cumulative negative effects from development.

Remote areas on public lands and conservation areas, including the NCA, might become enclaves for displaced wildlife populations. However, increasing and altering aircraft flight paths, and aircraft use over remote public lands associated with the new Las Vegas heliport, the Henderson Executive Airport expansion, and the proposed Ivanpah Airport would increase noise in remote areas. The increase in noise might reduce habitat quality, disrupt migration or breeding patterns for species that are intolerant of disturbance. Species activities that would be particularly susceptible to noise and disturbance include bighorn sheep lambing and raptor nesting. This could reduce the viability of populations and increase the possibility of local extinctions in the NCA and surrounding area. Proposed NCA management actions and

the protective NCA designation could reduce noise from surface activity by eliminating or reducing designated OHV routes, concentrating activities, and focusing on non-motorized recreation uses.

Socioeconomics

The cumulative impact boundaries for socioeconomics include the NCA, areas immediately adjacent to the NCA, and Clark County. Clark County is one of the fastest-growing counties in the United States; its population increased 120 percent from 1990 to 2003. The Disposal Area Expansion and transportation projects described above make it reasonably foreseeable that a long-term increase in population growth would continue.

Because of the small magnitude of the socioeconomic impact of BLM's proposed actions relative to the long-term development trend in Clark County, The proposed plan would likely create negligible impacts on taxes, employment, population growth, and development of Clark County overall; however, the existence of the NCA may cause long-term increases in property values for adjacent landowners

Long-term demand for recreational use of the NCA would increase as a result of county population growth, including redirection of many recreational demands to the NCA from county areas being developed, the "designation effect" of the NCA, and development close to the boundaries of the NCA. As cumulative recreational demands on the NCA increased over time, conflicts between recreational uses would likely increase.

Reasonably foreseeable population growth and development within Clark County and the entire Las Vegas Valley would create long-term moderate to major indirect impacts to other resources within the NCA. The long-term trend of increasing development and population growth would be the indirect cause of most of the cumulative impacts considered under other resource topics of this section.

4.17 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Section 102(2)(C) of the National Environmental Policy Act requires discussion of any irreversible or irretrievable commitments of resources that would be involved in the plan if it were implemented. An irretrievable commitment of a resource is one in which the resource or its use is lost for a period of time. An irreversible commitment of a resource is one that cannot be reversed.

Implementation of the proposed management plan would not likely result in impacts that could be characterized as irreversible and irretrievable commitments. Some small-scale disruption to resources might occur, but it would be mitigated, as appropriate.

4.18 UNAVOIDABLE ADVERSE IMPACTS

Section 102(C) of the National Environmental Policy Act requires disclosure of any adverse environmental effects that cannot be avoided if the proposal is implemented. Unavoidable adverse impacts are those that remain following implementation of mitigation measures or impacts for which there are no mitigation measures. Some unavoidable adverse impacts would occur as a result of implementation of this PRMP. These impacts would be a result of increased visitation and recreational use of the NCA, in addition to surface disturbance. The proposed plan was developed to respond to these impacts, however, and to be protective of the resources while allowing land use to be as diverse as possible.

4.19 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

Section 102(C) of the National Environmental Policy Act requires discussion of the relationship between local, short-term uses of the human environment and maintenance and enhancement of long-term productivity of resources. “Short-term” is defined as expected to occur within 1 to 5 years of implementation of the plan. “Long-term” is defined as after the first 5 years of implementation but within the life of the RMP.

The management decisions would result in various short-term effects, such as decreases in visual resource quality and recreational opportunities. The long-term productivity of resources within the NCA would not be diminished, however, because these short-term uses would be minimized by management actions to effect the opposite change over the long term. Overall, although there would be some disturbance to resources, the flexible and responsive management approaches within the proposed plan would protect the long-term productivity of the land, resources, and resource uses.